# The Builder.

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Proposed House at Reigate
House at Bickley, Kent
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## *Architecture at the Royal Academy.*

THE collection of architectural drawings at the Royal Academy seems this year to be an interesting and varied one; more interesting, both as to drawing and design, than the average. Though the works of the first importance that are illustrated are only two, there are a great many good designs of buildings public and private, some which are remarkable also as examples of effective and artistic drawing; and though this, as we have always said, ought to count as only a matter of secondary importance, and has on many occasions been far too much emphasised, it is nevertheless an element of interest.

Sir W. Emerson holds the leading place in the room, with his "Queen Victoria Memorial, Calcutta" (1599 and 1642), which is illustrated in a large perspective drawing, and in a large model standing in front of the drawing, to which a small plan is appended. The plan is unquestionably a very fine one. The whole building forms a great parallelogram with square towers at the outlying angles, nearly detached from the main block and standing out from it. The centre compartment, called "The Queen's Hall," is a circular domed hall, to right and left of which is an open quadrangle flanked on either side by the lower buildings, and closed at the ends of the building, each way, by a double colonnaded screen forming a segment of a circle on plan; this forms the central feature on the ends of the parallelogram. The main entrances are in the centre of each side; and provision is made for a vista from side to side, across the Queen's Hall, both on the longer and shorter axis. Among the details of the plan the manner in which a special design is given to the Durbar Hall, in one corner of the plan, without interfering with the symmetry of the whole, is a very good architectural point. As to the character of the design, it must always be a debatable question whether, in a building of this importance erected in a foreign country, one should import a style in common use in England, or let the building show the influence of the architecture of the land in which it is built. The Romans had no doubt on that point; they carried out their own style in every country they conquered; but then it was their style, whereas Italian Renaissance, which Sir W. Emerson has adopted, is not ours after all. It is a rather singular chapter in the vicissitudes of things architectural. The Romans derived a style from the Greeks; the Italians of the Renaissance took their style in a modified form from the Romans, and it was adopted by England as by most other European countries; and here it comes round, *viâ* England, to India, as the symbol of the conquering race. There is something to be said for it; though our own feeling would have been rather in favour of a more Oriental treatment on Oriental soil. The cupolas of the angle towers are indeed given a bulbous outline derived from the East, but this assorts rather oddly with the Renaissance architecture and the vase finials of the substructure. The moral might be—if you choose to be Renaissance (in such circumstances), be so completely; the classic and Oriental elements will hardly harmonise. In one point there is a certain characteristic treatment suggested by the climate; the upper order is kept well within the roof line, the projecting roof being carried on large cantilevers between the columns, one object in building in India being to keep the sunlight off the walls as much as possible, and make the roof constitute a kind of "solar topee." The interest of the design lies, in short, in the plan and general arrangement rather than in the detail, which is not very interesting; but a building with a plan like that must always have its effect, and it is certainly a grandiose conception as a whole. The drawing is remarkable for the immense pains which have been taken to get a texture in the expanse of blue sky behind the building; but in other respects, though a fine piece of perspective work, it hardly conveys the idea of white marble (which we suppose is the material) under a tropical sun; the lights would be brighter and the shadows more blue than is shown here.

The other work referred to, Sir Aston Webb's proposed screen building across the east end of the Mall and forming the long promised roadway through into Whitehall, is connected with the Queen Victoria Memorial in London, but is not

to be considered as forming a part of it; it is a building which, if erected, will be carried out by the Government out of public funds, and not out of the Victoria Memorial subscriptions. It would, however, form a state entrance or gateway to the Victoria Memorial Avenue. From the illustration, which by the kindness of Sir A. Webb we are able to give in this issue, it will be seen that the architect's original contrivance of the fountain which was to form the meeting point of the two axes, that of the Strand and that of the new road, has been abandoned. As now arranged the difficulty is got over, as will be seen by the plan, by the reversed curves on the two sides of the plan, each of which is arranged so as to be normal to the axis of the approach. This is a very clever piece of work, and may be recommended to the study of young architects. The axis on the Strand side, it will be seen, passes through the Charles I. statue, but the position of the statue and pedestal is obliquely across the line. It might be a question whether it were worth while to turn the monument round so as to stand parallel with the axis and face the gateway, but perhaps it would hardly be right to alter the position it has so long held. As the illustration is there we need not describe the design. It seems exactly the kind of thing that is wanted; in a case like this the use of the columnar order is almost a *sine quâ non*, for nothing else will give the dignity and stateliness required in such an erection; and indeed the whole idea of such a state entry or gateway is in itself so essentially Roman that the design would almost naturally fall into a Roman type. The simplicity and severity of line in the whole structure is to be commended. The three panels are to contain inscriptions, but as these had not been officially decided on the panels have been left blank or with merely a partial suggestion of an inscription.

Besides this important design, Sir Aston Webb exhibits drawings of two houses—"Re-modelling of the Manor House, Stoke d'Abernon" (1633), and "Headmaster's House at the Royal Naval College, Dartmouth" (1634). Both perspectives have a plan and a north point, thus setting a good example to the many exhibitors who neglect to give this indispensable information. The first named is a house with a long front and a columned loggia running along the garden side. This block is occupied by a large apartment in the centre, called "saloon," out of which open drawing-room on one side and dining-room on the other; rather an American form of plan. All three get their light from windows looking out into the loggia, which fronts south, so it may be supposed that there is a sufficiency of light. But why does the morning-room face west? Our conception of a morning-room is a room in which to meet the morning sun; it is in the afternoon and evening that the direct sun (in summer) becomes an inconvenience; in the morning, in this country, one is always glad to have it. The Master's House at the Naval College is a picturesque house with the now common but always pleasing incident of wide eaves apparently supported by the bays which run up to them, and which form parts of the dining-room and drawing-room plan.

Of the other R.A. architects, Mr. Jackson and Mr. Belcher do not exhibit this year. Mr. Bodley has four drawings; two of these (1455 and 1475) are water-colour interiors of two Elizabethan rooms in Powis Castle, both with the addition in the catalogue, "showing alterations"; but as there is nothing, except to those who happen to know the house, to show what is ancient and what is "alteration," the professed purport of the drawings is entirely lacking, the object seems to have been merely to produce a picture of an interior. This is hardly the way to illustrate architectural work. The "Interior of Chapel, St. Chad's, Hornington" (1539), is a small interior of a chapel with early Gothic detail in the masonry and late Gothic in the screens, etc.; which is taking the best period of masonry (unless we except Norman) and the best period of woodwork together, but it is, from the present-day point of view, very archæological architecture. The small pencil elevation of "Reredos, St. Edward's Church, Holbeck" (1550), is more to the purpose than any of the others. This is a reredos divided into widely proportioned panels containing sculpture subjects, with very rich tracery canopies over them; a deep and boldly treated open cresting crowns the whole; an excellent piece of work of its kind. Mr. R. T. Blomfield, the new architectural Associate, exhibits two drawings. Of these, "Leasam, Rye, Essex" (1507), has a very interesting plan of house and garden combined, showing how the garden is made to fit into the architectural scheme; the plan of the house consists of two main blocks arranged *en echelon*, only connected near the angles; probably one of these is the residence and the other "service," but the rooms are not named; they should be, as part of the merit of a plan may consist in the way in which the position of and access to special rooms is arranged. The view of the house, in pen line, shows a square brick block with quoins at the angles, a pediment on the surface of the centre portion, and a semi-circular window under it. This kind of architecture certainly does not sin against good taste, as there seems practically to be no architecture in it; but that we suppose is its merit. No one dislikes gew-gaw display in architectural detail more than we do; but it does seem to us that the art of architecture consists of something a little beyond these primary elements of building. Mr. Blomfield's other exhibit, a coloured perspective showing "The New Buildings, Lady Margaret Hall, Oxford" (1599), has more of picturesque interest in the grouping of the red-brick buildings with their stone doorways, and the treatment of the face of the dining-hall and library-block is characteristic. The plan is given, but, as in the other case, without the names of the apartments, except the dining-hall and library over it.

Having considered the exhibits of the Academicians, we may go on to notice some of the designs which represent public buildings or monuments. One of these is the work of a sculptor, Mr. F. E. E. Schenck, and perhaps is a little out of place in the architectural room, though it could not well have been hung anywhere else; it is sculpture combined with an architectural centre. It is entitled simply "Design for a Monument" (1440), but bears the inscription "Victoria I.," and may be intended for a specific site, though this is not indicated. There is a square podium with a heavy pediment and a bronze figure seated beneath it on each face; above this are two or three steps supporting a smaller block with a cornice, and on each face is a bronze group of figures on a smaller scale than those below; from this rises a massive stele bearing a globe on which stands a figure of Victory. The whole is very well composed, and shows that the sculptor has also a sense of architectural composition.

On each side of the large drawing of the Calcutta Victoria Memorial hangs a very clever and freely executed drawing by Mr. Rickards, in crayon with some touches of colour introduced; as drawings these are among the most effective things in the room. That on the left (1591) shows the interior of the Council Chamber of Deptford Town Hall, by Messrs. Lanchester & Rickards; the wall is plainly treated in pilasters and panels; above this some of the ornament is a little too *rococo* for our taste, but it is effective; the pendant chandeliers are of very picturesque design; in the drawing they seem to fill up the space a little too much, but this may not be the case actually. The other drawing (1605) represents the domed interior of the Council Chamber of the Cardiff Town Hall, by the same architects; the dome is plainly treated with panelling (there is after all hardly any more satisfactory way of treating a domed ceiling than this simple device); in the pendentives are circular windows with boldly treated architraves; a columned recess behind the chair adds to the architectural effect of a very satisfactory interior.

Among other designs of public buildings Messrs. Russell & Cooper send a long perspective view of their "Town Hall and Law Courts, Hull" (1449), a design in which length in the material sense, and breadth in the æsthetic sense, combine to make a remarkable front or rather flank to a very large building. The ground story is perfectly plain rusticated masonry with plain windows, carrying an order of columns above which is continued the whole length of the building, unbroken except by one centre pavilion with a high deep arch, in the lower part of which is a portico with sculpture above it. This design illustrates very well the effect of continuity of design and severity of unbroken line in a large classic building; the tower shows the same severe treatment; a lofty mass of rusticated masonry, unmarked by any disturbing feature, carries a lantern in two stages the outline of which is not quite pleasing, but it avoids mere prettiness and is in keeping with the general treatment of the building. No plan is shown either to this or to Mr. Fetch's rather gloomy drawing of "Municipal Building, South Shields" (1480). The very strongly marked rustication of the basement and of the lower portion of the pilasters, in this design, is possibly a little over-done, but it is at all events not commonplace, and the effect of the low wide arched windows immediately above this

basement carries out the idea of an almost fortress-like solidity which has evidently been the architect's aim. Messrs. Matear & Simon's "Liverpool Cotton Exchange" (1489) has been illustrated in our pages; and perhaps the front of a Cotton Exchange has never before put on such a garb of Greek grace and symmetry; the long colonnade with the shadowed recess behind it, in the upper portion of the front, is quite useless, but we have no objection to it on that ground; it is a fine piece of architectural scenery, and suits well with a city of which, in its classic architecture, St. George's Hall may be said to be the key-note. In No. 1498 we come upon a staircase interior, that of the Municipal Buildings, Walsall, by Mr. J. S. Gibson, an effective pencil drawing showing deep side arches springing from architraves carried on coupled marble columns; a very good piece of classic work. Another staircase interior is shown in Messrs. Wills & Anderson's "Hall and Staircase, Sunderland Municipal Buildings" (1566); a rather unusual design shown in a slight washed drawing. Above the first floor gallery the bays are divided by coupled columns; on the ground story the supports are plain square stone piers with bands of darker stone, and a massive unmoulded abacus; the corners of the piers are taken off in a manner not quite clearly indicated in the drawing, but leaving the angles of the abacus projecting; it is a pity that the generally solid effect of the whole is spoiled by the little bit of pendant, a kind of string of foliage, dropped from under the angles of the abacus; a detail quite out of keeping with the rest of the design. The roof is a circular barrel vault with skylights rather crudely cut out of the centre portion.

Mr. H. T. Hare exhibits a water-colour drawing of one corner of his "Public Library, Harrogate" (1545), a piece of classic masonry work of the right type, with sculpture effectively introduced. A centre place is given, and rightly, to the very clever and original design and plan for the double-armed open-air chapel for men and women for the King Edward VII. Sanatorium (1534), by Mr. H. Percy Adams, which was illustrated in our last issue, to which we may refer the reader; had we known that the drawing had been sent to the Academy, we should have held it over till after the exhibition opened. Two other drawings we cannot pass over in our opening article are Messrs. Nicholson & Corlette's "Design for Liverpool Cathedral" (1580), and Mr. H. Percy Adams's two views of the "New Central Reference Library, Bristol" (1624, 1625). The Liverpool Cathedral drawing is too washy in handling, as a drawing, but it is a large and effective view of a remarkable design in which the central feature, probably in part a suggestion from Ely, is novel and striking. It appears to us that there is rather too much of a riot of rich tracery in the windows in contrast to the very broad and solid treatment of the walls and buttresses; it suggests almost the idea that the window tracery had been filled in by a later generation; this of course often did happen in actual mediæval building, with the same somewhat incongruous effect, but there was no need to imitate this result in a modern building designed all at one time. The drawings for the Bristol Library unfortunately are not accompanied by a plan, they are simply pieces of external architecture, but as such they are most picturesque and original. The general style might be called domestic Gothic, but it is treated in quite an individual fashion in detail; and in the perspective view of "The Front to the Deanery," where we see the building standing on a slope, the whole group, with the picturesquely treated quadrant which connects the two principal blocks, is most interesting from a pictorial point of view. How far this treatment of masses of wall, with windows only sparingly introduced here and there, suits the purposes of the library one cannot of course judge without a plan; but it certainly makes a very interesting piece of architectural composition.

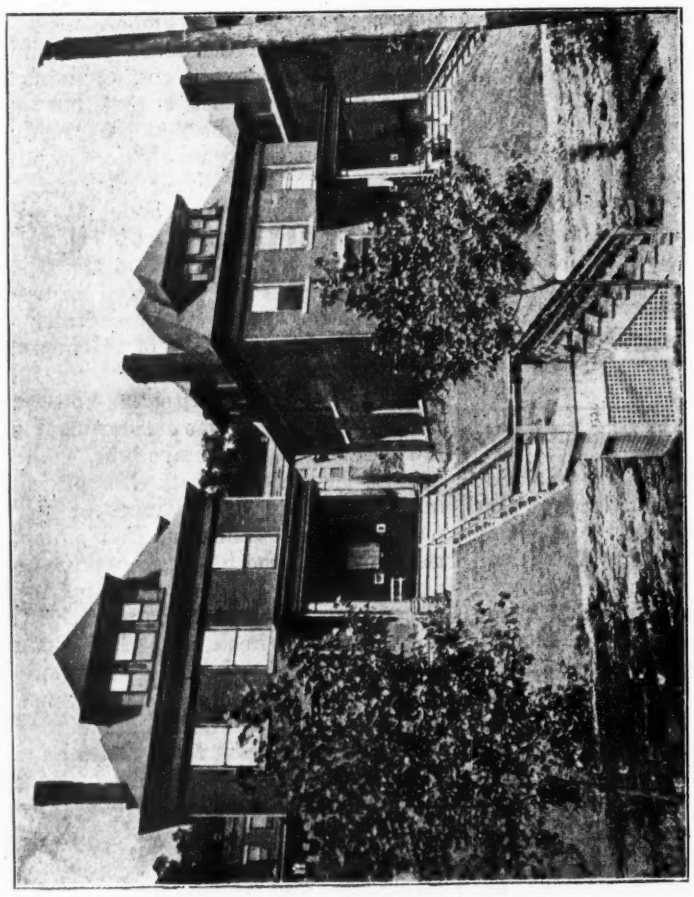
## ARTISANS' COTTAGES IN AMERICA.

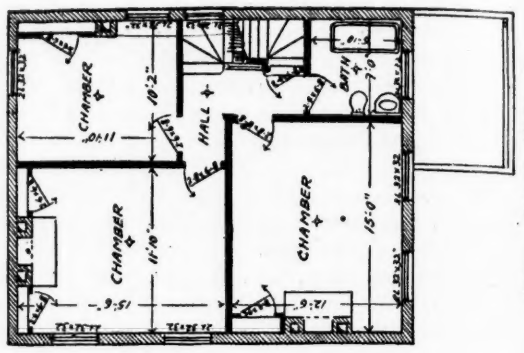
THERE is to be a competition in cottages at Garden City this summer, and the question of the housing of the working classes will be brought into prominence accordingly. Lively interest in the matter is being displayed in the United States as well, but with a difference. Comparison and consequent reflection are made possible by the opportune publication of a long bulletin by the National Bureau of Labor, for it contains a number of plans and illustrations of houses erected for workpeople by their employers. The volume was prepared to represent the operations of the Department at the Louisiana Exhibition. The elevations and views of these workmen's dwellings, which occupy so much space in the book, were selected from a collection of 285 drawings or photographs, furnished by sixteen firms, which made an object lesson even for casual visitors, and an open text-book for commercial men. In this, as with effort in many other directions, what is left with us to individual initiative or business enterprise, is there taken in hand by a staff of official experts, and supported by government appropriations. It is the irony of fate that, while we find our chief interest in cottages through a squabble between a landowner, who is one of His Majesty's judges, and a local authority, they are regarded in the States as one of the ways by which strife between employers and employed may be averted. They rank with profit-sharing, shorter hours, club-rooms and libraries, gymnasia and sick or accident funds, cheap meals and baths, and all the other beneficial measures comprised in the term "Industrial Betterment," as a means of promoting cordiality and fostering goodwill between masters and men.

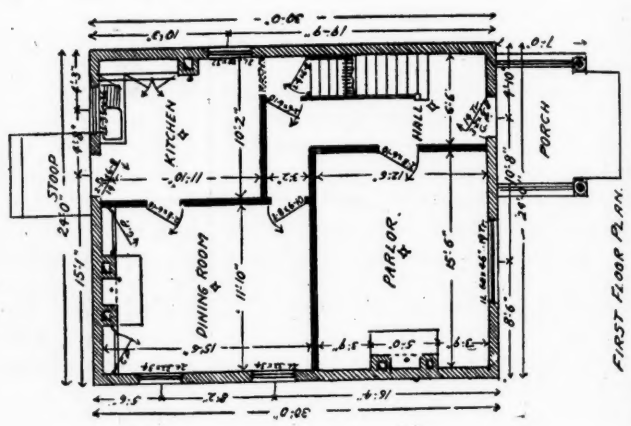
With such variable factors as locality, land values, and building charges, there can be no exact comparison between houses here and in the States, but a rough conclusion can be arrived at from the particulars appended as to rent and accommodation. But it must be borne in mind that, in most cases, the dwellings are let at rents that are only calculated to cover depreciation, and cannot be taken as ordinary building investments. It may be remembered that the members of the Moseley Commission reported "higher," "much higher," and "very much higher" rents than in this country. There was no difference of opinion upon this point, and where attempts were made to estimate the ratio of increase, the lowest calculation was "about 20 per cent. higher," and so on to "nearly double," "almost as much again," up to "50 to 100 per cent. higher."

There may be differences of opinion about the comparative cost of living on this side of the Atlantic or that, but there seems to be no doubt that the American operative has to pay much more in house rent than his Old World brethren. So far as the illustrations show, it would appear that he obtains good value for his money; but whether, on the whole, and save in such exceptional instances as these, the workers in the States are better housed than those of this country, cannot be well determined.

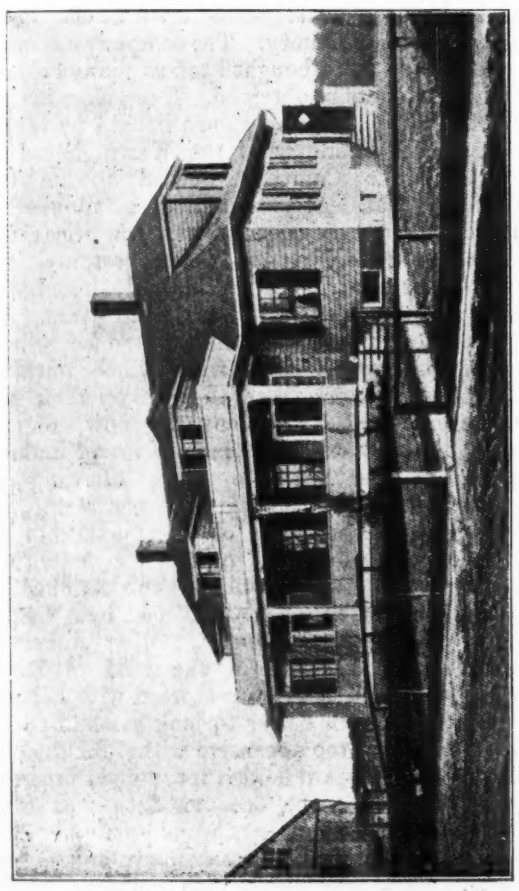
In the majority of cases the houses are built and owned by the employers. Some few prefer to encourage the men to acquire their own houses through building associations or advances of money payable by instalments, and probably this would be the better, if not the only, plan where a business grew up in an already populated locality. But in setting up a firm on fresh ground the course commonly followed is to build and let suitable dwellings. In one instance it was found that workers did not care to buy houses to which they would be tied. Their "hostages to fortune" did not include a house which might prevent them leaving the place when they wanted to. In another it was the employers who found freeholds objectionable, because a workman-owner on leaving sometimes sold his house to an undesirable successor, who was not inclined to comply with restrictions or requirements insisted upon for the good of the community. The company has in this case since bought back as many cottages as could be obtained. Experience in these respects has only been bought by failure. The liberality of the Westinghouse Air Brake Company turned to its own defeat. After building a number of houses on contract at cash prices they sold them to employees at cost, arranging for repayments by monthly instalments for periods of ten or fifteen years. The terms were too tempting to be refused, but when slack times came unthrifty purchasers failed to keep up their payments. The company now requires money down to the amount of one-fifth of the purchase price, allowing the remainder to stay at 5 per cent., with the expectation of a reduction of the principal each quarter, but without making any stipulation to that effect, so that slack times can be met by a suspension of repayments. Other difficulties have occurred in the kind of houses erected. One firm started with cottages that were better to look at than to live in, and too expensive withal for the class they were intended for. Then tenement houses, some accommodating as many as eight families, were put up. These also proved unsatisfactory, and a fresh start was made with cottages, simply and conveniently constructed, and letting at a comparatively low rent. For several years all new dwellings were built on these lines, but as population increased these occupied more ground than could be

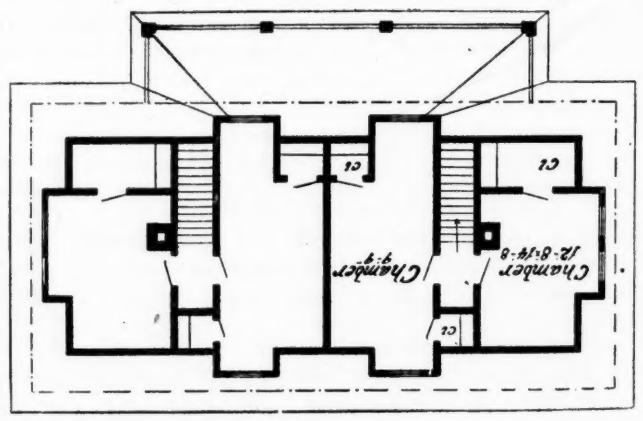


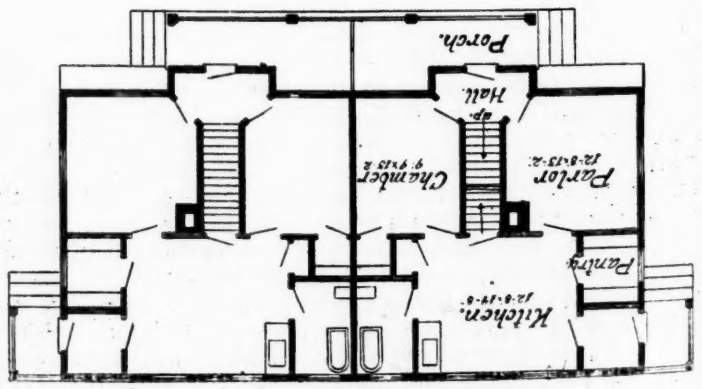



*American Artisans' Dwellings.*





spared, and a return has been made to blocks of houses as well as suites of rooms over shops. Yet trouble remains, for it is stated that the fashion of the place has set in for detached dwellings, and operatives "demand a cottage."

The housing problem, however, is but part of the more extensive movement towards Industrial Betterment, or Welfare Work, as it is sometimes called. It is significant that not one of the sixteen firms that furnished plans and photographs for this exhibit holds by houses alone in concern for the well-being of its workpeople. There is no need to detail the various measures by which these employers endeavour to lighten toil and brighten leisure, or try to improve the conditions of life all round for workers and their families. These are often determined by local circumstances, or grow out of some other provision made for the uplifting of workpeople. A casualty room set apart in a mill led to the engagement of nurses who care for cases of sickness in the homes of the men. The promotion of physical culture in one instance prompted the making of a skating pond out of a piece of waste ground, and the fact that mill property, in another case, skirted the sea-shore, brought about the building of a parapet wall along the front, to make a beach and promenade, and the erection of two houses for the convenience of bathers of both sexes. Apart from incidental deviations such as these, betterment efforts run upon lines which have already been indicated. In one place or another they touch most of the interest and aspirations of humanity, and it is maintained that they have, according to an official report, "naturally created a better understanding between employers and employed, all other labour conditions being equal, engendering a spirit of amity, resulting in improved workmanship and yielding larger returns on the commercial side of the project." The movement is widespread, and still spreading, in the States. A recent inquiry showed that, in 1903, 108 establishments, employing 59,291 persons, had one or more betterment measures in successful operation in New York State alone. It is being officially fostered as far as possible by gathering and circulating information about it, and it may not improbably have far-reaching consequences.

## NOTES.

**The Condition of the Parthenon.**

It appears that at the recent Archæological Congress at Athens the question was seriously discussed as to raising the fallen columns of the Parthenon which are still *in situ*, though prostrate. M. Kavvadias is in favour of raising them and setting them in their presumable places (it would probably be impossible to ensure that each particular column stood where it formerly did), and we are so far from disagreeing with him that our feeling is rather, why was it not done long ago? The *Times* correspondent quotes Mr. Penrose (with whom he visited the Parthenon shortly before Penrose's death) as against the undertaking, on the ground that we could not do over again the fine work which was necessary in fixing the columns. This seems to be refining a little too much; with proper instruments it should not be impossible to adjust the drums and the general axis of the columns aright, and it would be easy to keep a memorandum as to which columns had been set up in modern times and which had always remained standing. We should then have certainly a better idea of the perspective effect of the Parthenon than we have now. The question was also raised as to the portion of the original sculpture still remaining on the west front, Professors Dörpfeld and Fürtwangler urging that it should be removed to a museum and replaced by casts. We think it would be a pity to repeat the drastic methods of Lord Elgin without the same excuse, the Parthenon being now in good hands and well cared for. At the time of the Elgin raid the sculptures were so brutally abused that only removal could have saved them for the world. But had the Parthenon then been under such good care as it is now, we should have been quite ready to echo Byron's indignation against the spoiler—

> "Who snatched the shrinking gods to northern climes abhorred."

**Stonehenge.**

The action brought against Sir Edward Antrobus to establish a public right of way to Stonehenge has failed, judgment having been given last week by Mr. Justice Farwell. From the moment the case was opened it was clear that the evidence was not very strong in favour of the establishing of a definite public way to Stonehenge, since the very nature of the locality gave opportunities for any number of indefinite, and, if we may call them such, technically illegal paths. The Commons Preservation Society has in the past done such invaluable work, and has so judiciously asserted and vindicated public rights that we regret that it should have failed in this case. From one point of view, however, this failure does not seem so particularly unfortunate. Sir Edward Antrobus preserves his right of property in the site of Stonehenge, unhampered by any public right of way, and he has always been willing to sell the site and ruins for a fixed, though large, sum. It is unlikely that public opinion will ever sanction any acts of destruction by a proprietor of Stonehenge, even if he desired to perform them. Thus there seems to be no reason to fear for the safe preservation of the ruins. If, on the other hand, the action had succeeded, it is not so clear that public right of way to Stonehenge might not have made its preservation more difficult. The practical solution of the matter is the purchase by the nation of the ruins. If a railway has to be made through a piece of land no one thinks any the worse of the proprietor for demanding a high price; and, after all, if a landowner has a unique possession such as Stonehenge, he is not greatly to be blamed if he also should demand a high price for it.

**The Madrid Reservoir Disaster.**

A most serious indictment now lies against the capacity and prudence of the Spanish Public Works Department, relative to the failure of the partially-constructed reservoir at Madrid. This work, designed as the third reservoir for use in connexion with the water-supply system of the city, was being built in underground vaults, one of which collapsed without the least warning. The immediate cause appears to have been the bending and rupture of the columns supporting the roof. But there are some very ugly facts in the background. As far back as 1901 a partial collapse took place, and the Minister of Public Works was warned that, owing to the insecure character of the subsoil, the reservoir would never be able to withstand the pressure of the water intended to be stored in it. Again, in 1903 complaints were made as to the inferior quality of the cement supplied, and about the end of March this year several deep cracks appeared in the masonry. The authorities were at last aroused to some sense of danger, with the result that the construction was subjected to severe tests during the first week of this month. These tests seem to have given the death-blow to the faulty structure, although the Government engineers ignorantly thought they demonstrated its perfect safety. This lamentable occurrence, which has caused the death of more than 200 men, serves incidentally as another reminder of the undesirability and illusory character of heavy test loads.

**The Telephone Fires.**

Some of the questions which arose at the inquiry into the causes of the two fires which took place simultaneously on the premises of the National Telephone Company on the morning of February 28 are of great public interest. Dr. Waldo performed a public service in submitting some of them to the decision of the jury. It will be remembered that the jury found that the fires were caused by a contact between one of the Company's wires and the conductor-rail of the District Railway Company. Whatever caused this contact, it is obvious that telephone cables should not be allowed near high tension circuits unless properly protected. They also recommend that greater use should be made of incombustible materials in the construction of the test and distributing rooms of telephone exchanges. Special powers are required to regulate all structural and other matters connected with telephone services. They thought that the Oxford-court premises were not satisfactorily provided with means of escape from fire. From the evidence given at the inquiry it appears that the electrical devices used to prevent high tension current getting into the exchange or possibly into consumers' houses were quite inadequate, and on the morning of the fire a telephone user might easily have obtained a most unpleasant shock. The neglect of suitable fuses is the more surprising as we find that very stringent rules on this point are laid down by the insurance companies. Although not directly connected with the inquiry, the question was discussed as to whether it was advisable to use a telephone during a thunderstorm. One of the technical witnesses stated that, in his opinion, although it was very unpleasant it was not dangerous. Sir Homewood Crawford, however, stated that it was dangerous, and that there were cases in which people had received fatal shocks. Personally, we

have known cases of extremely severe shocks being received, and there is always danger in using a telephone connected with outside wires during a thunderstorm.

Workmen's Compensation.

THE House of Lords, in the case of Brintons, Limited, *v.* Turvey, have confirmed the Court of Appeal, and held that a man who has contracted anthrax in the course of his employment has sustained personal injury by accident, and is entitled to compensation under the Workmen's Compensation Act. Lord Robertson dissented from this opinion, and Lord Lindley said it must not be taken as involving the doctrine that all diseases caught by workmen in the course of their employment were to be regarded as accidents entitling them to compensation. Where, however, is the line to be drawn? This question is one of such importance that we think the position of employers ought to be clearly defined in the Bill now before Parliament, and upon which we commented in a recent issue. The Departmental Committee, whilst this decision was pending in the House of Lords, considered that it would be premature to amend the definition of the word "accident," but they received very important evidence upon the point, and especially in reference to lead-poisoning, in which disease it was stated that it would be impossible to determine with any certainty how or when it was contracted. The conclusion the Committee arrived at upon this point was that if diseases incidental to the occupation were to be the subject of compensation, it should be under a system of sick insurance, and not a system resting upon personal liability of the employer for an accident, the cause of which must be proved. It is certain that the effect of the above decision will be to cause considerable litigation, raising questions before the arbitrators most difficult for decision, especially having regard to the dictum of Lord Lindley quoted above, and it is to be hoped that some certain solution may be arrived at in the present Bill, since uncertainty on such a point is a hardship to both employer and employed, and raises also difficulties in the way of insurance.

The Proposed Pneumatic Dispatch Service.

IF sanctioned by Parliament, the pneumatic tube scheme proposed for the metropolis will be of much value, reducing street traffic to no inconsiderable extent, and facilitating the delivery of parcels and letters. The project includes provision for nearly 100 miles of double tube lines, and some 200 stations, distributed so that every district in the county of London will be adequately served. The promoters of the Bill suggest the co-operation of the Post Office, and offer to deliver mails from point to point in the tubes to be devoted to parcels transmission; or, if preferred, to construct a special system of tubes for exclusive use by the department. The experience of several large American cities points clearly to the great advantage of the pneumatic service both for merchandise and for letters. Unfortunately, the Postmaster-General appears to have objections to its introduction on the ground that the profits of the parcels post might be diminished. It is a thousand pities that our postal system has come to be looked upon as a source of revenue rather than a service for the benefit of the people, and we sincerely hope that Parliament will not be actuated by any dog-in-the-manger policy when dealing with the Bill about to come before their consideration.

The Barossa Dam.

A NOTEWORTHY example of concrete construction is presented by the dam built at Barossa, in South Australia, across a river flowing into the Gulf of Gawler, by Mr. A. B. Moncrieff, chief engineer to the South Australian Government. This work, which has recently been completed, is of arched form, and extends from a perpendicular cliff on one side of the river to a sloping bank on the other, projecting as a kind of spur. In plan the outer or upstream curve was struck with a radius of 200 ft., and represents an arc of 470 ft. The cross-section of the dam is approximately a right-angled triangle, the vertical face on the upstream side having a height of 95 ft. above the former level of the river. Owing to the resistance afforded by the curved form of the work, it was not necessary to make the maximum thickness more than 36 ft. at the base and 4 ft. 6 in. at the top. Up to the height of about 80 ft. from the foundation, "plums" of rock were embedded in the concrete, and above that level rows of curved rails connected by fish-plates were added as reinforcement. Thus to a certain extent this dam may be looked upon as an example of concrete-steel construction. Great care was bestowed on the mixing of the concrete, which was made in quantities of 1 cubic yd. at a time, and before deciding upon the proportions of cement, sand, and stone for different parts of the structure, experiments were conducted with the object of determining the resistance of the product to percolation at the calculated water pressures. As a precaution against discontinuity of the work, the beds of concrete were laid so as to break joint horizontally and vertically. In places such as Barossa, where an effective arched dam is possible, the cost of construction is considerably less than for a simple gravity dam. This point is shown by comparing the actual cost, 186,000*l.*, of the Barossa dam with the estimated cost, 230,000*l.*, of a gravity dam on the same site.

The Egyptian Hall and Nos. 166-173, Piccadilly.

THE demolition is in progress of Nos. 166-173, Piccadilly, a group which includes the Egyptian Hall. Of this building, when it was Bullock's "Liverpool" Museum, and its original surroundings, we published an illustration on January 3, 1903. The house, No. 173, just vacated by Messrs. H. Peat & Co., saddlers, seems to have been built for a private residence; the front has remained unchanged, as it appeared in our view. The Egyptian Hall, next west, was erected in 1812 after designs by P. F. Robinson—the figures of Osiris and Isis, on the façade, being by L. Gahagan—at a cost of 16,000*l.*, for W. Bullock's natural history museum gathered in Central America, and for a portion of the Leverian collection, which were dispersed seven years afterwards. Robinson took most of his details from the temple of Isis at Denderah; we may presume he was not responsible for the mistake of dividing the elevation into two stories. During the ensuing nearly forty years the Egyptian Hall was used for a succession of shows, exhibitions, panoramas, etc., fifty-three in number, of which we may mention pictures by Haydon and Sir George Hayter; Captain Siborne's model of the Battle of Waterloo (now in the United Service Museum at Whitehall); Dupressoir's views of Paris, 1835; models of Jerusalem, by Brunetti, and of Venice, 1843-7; and Bonomi's panorama of the Nile, 1850.

Reproduction of Ancient Drawings.

THE announcement by Mr. Sidney Colvin, in a letter in the *Times* last week, of the formation of a Society for producing reproductions from the drawings of old masters, will be gratifying to all who are interested in art. There are at present numbers of drawings by great artists of the past in existence, buried in portfolios, and known only to their owners and to the few friends to whom it is possible occasionally to show them. To bring these treasures practically to the knowledge and within the possession of art-lovers at large will be a truly good work; for with monochrome drawings the reproductions, with the processes now available, may be considered to be, for study and enjoyment, almost as good as the originals; it is not like the case of photographs of pictures, which can give only the design without the colour. The annual subscription to the Society, which is to be called the Vasari Society, is fixed at the small sum of a guinea, and the Society hope during the first year to issue, for this subscription, a selection of at least twenty drawings in the British Museum, by Leonardo, Titian, Holbein, and others. There ought to be no lack of subscribers for such a good return for their guinea. The Hon. Secretary to the Society is Mr. G. F. Hill, 10, Kensington-mansions, Earl's Court.

## THE ROYAL SANITARY INSTITUTE:
### MEETING IN LIVERPOOL.

A PROVINCIAL sessional meeting of the Royal Sanitary Institute was held on the 15th inst. in the Arts Theatre of the Liverpool University. Sir Francis Sharp Powell, Bart., M.P., Vice-President of the Institute, occupied the chair. Dr. A. A. Mussen, Assistant Medical Officer of Health, acted as local Hon. Secretary.

Mr. John Morris, Deputy-Chairman of the Liverpool Housing Committee, formally welcomed the Institute to the city. He said he felt sure that the visitors would find in Liverpool much to interest them in connexion with the housing and rehousing question. A great deal had already been accomplished in Liverpool in the direction indicated, but there were still between 8,000 and 9,000 more slum dwellings to deal with.

The Chairman said the last few years had been eventful ones in connexion with the movement to house and elevate the poor, and satisfactory progress, on the whole, had been made during the period. He was by no means certain that a stage had not been arrived at in the history of rehousing when it fell within the duty of the administrator rather than the legislator. If there was to be sound progress in the housing of the people, there must be hearty, genuine, and intelligent co-operation between the architect, the physician, and the inhabitant. It was not enough to build their house. The house would be no better in the course of a few years than its predecessor except the physician was there with his lessons

of science, and the friendly visitor with kindly assistance and intelligent suggestion. It was only by continual vigilance, incessant action, and perseverance that the evil of insanitary conditions could be cured. They would act wisely and judiciously if they continually impressed upon the people the fact that, after all, a duty must devolve upon the inhabitants after the architect and the corporation had done their work. He desired to see the scattering of the population by means of trams and other methods of locomotion, which would prevent that heaping up of the people which, however well the houses might be constructed, must always be a source of peril and danger when the population had to be concentrated.

*Rehousing.*

Mr. Fletcher T. Turton (Deputy Surveyor to the Liverpool Corporation) read a paper upon "Recent Methods of Rehousing Tenants Dispossessed from Insanitary Property." He said that in 1864 it was estimated that 22,000 houses in Liverpool were structurally insanitary. In September, 1902, a street-to-street examination showed that the number of structurally insanitary houses remaining to be dealt with was 9,943, notwithstanding the fact that up to then the Corporation had under a local Act dealt with about 8,000 houses, the balance, about 4,000, having been demolished by owners for sites for business purposes. The estimated number of back-to-back houses remaining was 8,600. The death-rate of the areas dealt with averaged about 60 per 1,000 per annum. Although he could not say that the whole of this excessive death-rate was due to the insanitary conditions of the property, the squalor, habits, and poverty of the tenants must account for a great deal. The demolition of so much property naturally caused a great displacement of population, and although private enterprise had built dwelling-houses to the number of between 800 and 900 on sites sold by the Housing Committee for that purpose, and the Corporation had themselves erected St. Martin's-cottages, Victoria-square, and Juvenal-dwellings, the number of tenants displaced and who occupied a dwelling-house provided either by private enterprise or the Corporation was infinitesimal, a fact not difficult to realise when the rents of the houses provided by private enterprise were, at any rate, generally double those paid by the dispossessed, and those in Corporation dwellings much in excess of the same rents. The various obligations of the Corporation to rehouse involved work in the shape of building of a huge character, and had resulted in the City Council and the Local Government Board having approved of a scheme for building 1,666 tenements. Mr. Turton gave a detailed description of the new houses erected on the first portion of the Hornby-street area, the newest type of house erected, as well as the latest. The total number of insanitary houses proposed to be acquired was 511, in addition to which there were twenty-three sanitary houses, making a total of 534. The population of the insanitary houses was 2,431. The new dwellings comprised twenty-three blocks, or 445 dwellings, which, it was estimated, would accommodate 2,476 persons. There are fifty four-roomed dwellings, 257 three-roomed dwellings, 125 two-roomed dwellings, and twelve one-roomed dwellings, a keeper's house, seven shops, and a recreation ground containing about 1,755 sq. yds. In Hornby-street the new dwellings are set back from the present line of street, so that for a considerable portion of the length of this street the width between the main line of the new dwellings will be 70 ft. Each house is provided with a separate sanitary convenience, and also with a separate scullery. The buildings as a whole are three stories in height, each living-room containing at least 150 super. ft., the principal bedroom 125 super. ft., the second bedroom 100 super. ft., and the third bedroom, where one is provided, between 80 and 90 super. ft. The average height of the rooms is 9 ft. clear. The materials used in the construction are local grey brick with red brick dressings, buff terra-cotta being sparingly used and only in the entrances. All the staircases are lined with glazed bricks, the roofs slated, and the floors constructed with small steel joists with coke breeze concrete, the flooring boards being nailed direct on to same. The ashes are discharged into bins by means of shoots at the back, and are collected daily by carts. The first portion of the scheme, which has been completed, has involved the demolition of 145 houses. The new dwellings on the site of this demolished area contain 138 houses, and it is now proposed to proceed with the demolition of a second portion, and the dispossessed tenants from such portion will occupy the dwellings just completed. In this manner it is thought that the whole scheme will be carried out in three portions. The plans for the whole of the scheme had been approved by the Local Government Board, who had allowed eighty years for the repayment of the loan for the purchase of the land, and sixty years for the repayment of the loan for the erection of buildings. The Corporation had had many schemes in hand for housing the working classes, but this was by far the largest attempted. The total cost of the scheme was estimated at 150,000*l*. In all these dwellings the Housing Committee only admitted as tenants those dispossessed by their operations, those that had lived in houses closed under the Housing of the Working Classes Act, 1890, or those who had been living in cellar dwellings also closed. For some years past no tenant had been dispossessed by the operations of the Corporation without having been given an opportunity to occupy one of the new tenements provided. With regard to the poverty of the tenants, he was informed by a guardian of the poor that several thousand families in Liverpool subsisted on an average of less than 10s. per week, and a greater number on less than 15s. per week. A great proportion of these people were at present occupying insanitary houses, and were the class of persons with whom the Corporation had to deal. Sheer poverty and distress in many cases prevented some of the tenants availing themselves of the new accommodation provided. The number of houses at present provided seemed to be somewhat in excess of the demand, but this arose not from the fact that the houses were not popular, but that they were reserved exclusively for those dispossessed. Every one of the dwellings at present vacant could be let five times over if the Committee would only relax their rule; but they had stood firm to their task, finding that as private enterprise could not provide at a reasonable rent for those dispossessed, they (the Corporation) would do so. The total cost of the work of demolition and of the dwellings which had been provided by the Corporation, including Victoria-square and Juvenal-dwellings, was about 789,000*l*., which entailed an annual cost to the rates of about 28,639*l*. after allowing for rents received. This was equal to a rate of about 2d. in the pound. Of this amount he estimated that the loss of providing for the dispossessed amounted to over 6,000*l*. per annum, equal to something less than ½d. in the pound. At the end of the various periods for which the loans for buildings were granted, and which varied from thirty to sixty years, the ratepayers would have a valuable asset in the shape of rent-producing property. On the general results of the work he could speak with great confidence. In conclusion, he replied to a criticism frequently made to the effect that these dwellings were erected too near the heart of the city, and that it would be better to move those dispossessed at once to the outskirts. Those who made remarks of that nature could hardly be aware of the conditions prevailing in the great labour mart of the city—namely, the docks. Here the work was practically all casual, and employment very irregular. On the whole many men were only able to obtain work for three days per week; but notwithstanding this they must be constantly in attendance if desirous of obtaining work.

Mr. Joseph Roby (Chairman of the Liverpool Dwellings Sub-Committee) opened a discussion. He considered it was essential that the people should be housed close to their work; a great many people living in insanitary areas were brought up in the town, and would not live in the outskirts or country, even if houses were provided for them there.

Dr. Berry (Wigan) described what had been done by the Wigan authorities.

Dr. W. A. Evans (Medical Officer of Health for Bradford) said he did not know any town except London that had done so much as Liverpool in the way of housing the working classes, and that within about ten years. No scheme of housing was likely to be successful which did not provide accommodation for each and every kind of the inhabitants in the insanitary area itself.

Mr. A. M. Fowler, M.Inst.C.E. (Manchester), adverting to the housing problem in Liverpool, expressed the opinion that when the docks were made land should have been set apart by the Dock Board for dwellings for the working classes to be employed there. To his mind, he said, it was a disgrace to the dock authorities of Liverpool that they did not provide dwellings somewhere within a convenient distance. He said the large blocks of dwellings, such as those in London and Liverpool, could not be ventilated anything like so well as the back-to-back houses built on the Leeds plan.

Mr. G. Kyffin-Taylor (Liverpool Housing Committee) contributed a paper embodying views similar to those carried out in Liverpool. He, however, was in favour of a number of houses being also provided for some of the working people on the outskirts of the city.

Dr. E. W. Hope (Liverpool Medical Officer of Health) pointed out that the back-to-back houses in Liverpool being demolished were in very narrow streets, and not in wide thoroughfares, such as in Leeds. He said, besides providing dwellings in the town, they must give to the labouring classes who desired it the advantages the better classes wanted for themselves in the way of residence in the more healthy suburban districts.

The proceedings terminated with thanks to the Senate of the University for the use of the Arts Theatre, and to the Chairman.

Later in the afternoon the visitors inspected at the Hornby-street area the most recent work of the Liverpool Housing Committee in the provision of houses for dispossessed tenants.

## THE BUILDING TRADES EXHIBITION.

A BUILDING Trades Exhibition was opened at the Royal Agricultural Hall, Islington, on Thursday, and it will remain open until Saturday, May 6. The exhibition was officially opened by Lord Windsor, First Commissioner of Works, before a large audience of visitors and exhibitors.

Lord Windsor said that if any proof were wanted of the undoubted success and usefulness of the Building Trades Exhibition it could not be better found than in the ever-increasing number of exhibitors. He understood that in 1895 there were ninety-two exhibitors, and during the last five exhibitions, which were held biennially the number of exhibitors had steadily and consistently mounted up to the no inconsiderable figure this year of 317. He felt certain that the public would recognise the usefulness and importance of such an exhibition. The increase in the number of exhibitors showed on the one hand that the designers and manufacturers in the industries connected with the building trade found it worth while to place their inventions and improvements before the public; and on the other hand the more complete the exhibition became the more was it worth the while of the visitor that came there, and the better able was he to carry away a mass of useful hints if he was interested in building and the equipment of buildings. One thing he wished to make some reference to was the question of smoke abatement, for he saw there was rather a special section set apart with regard to that. It appeared to him that they had been rather lagging behind in dealing with this great smoke nuisance. It certainly was not only London which was the great transgressor, because they had only to visit the large commercial industrial towns to find hundreds of acres of land where the vegetation had been killed and where the country suffered in consequence of this smoke nuisance. But in London they knew it was hardly bearable when there was a visitation of fog. They saw the trees in the parks dying because of this sooty enemy, and they were driven to the planting of plane and poplar trees, which were the only two of the large forest trees which seemed to flourish in spite of the smoke nuisance. And did not their buildings suffer just as disastrously? How much of the old stone work of London was destroyed by smoke? How many of the old stones which ought to be consecrated by the hand of Time had either become unrecognisable or had had to be displaced by modern restoration. They had fortunately in this country their Portland stone quarries, which provided a stone which seemed to be most suitable for the London atmosphere, and which he ventured to think was also in its white lights and grey shadows perhaps the most beautiful for London. But in spite of this they had to go to their professors of chemistry and ask them to assist in determining how they could preserve the stone work of London. Although cure was a very

good thing, yet prevention was better, and he certainly trusted that by that Exhibition they would keep before the public all the best improvements and inventions with regard to smoke abatement, and that the people of this country would realise more and more the advantages of having a pure atmosphere. He would not detain them with any lengthy reference to the many stands at that most important exhibition. Those exhibits dealing with fireproof buildings were of intense importance, because there was no aggregation of human beings in towns or cities where there would not be and must be some risk of fire. Vast strides, however, were being made in this direction, and it was most satisfactory to know how many of the exhibits dealt with this important question of fireproof building. They all knew how constantly they were confronted with new materials and new methods of utilising materials. They saw the building of their London streets; they saw the skeletons of buildings being reared up in a framework of steel, which might be more or less concealed by brick or stone hereafter; and they saw sometimes the distressing effect of what appeared to be a massive Portland stone wall resting apparently upon a plate-glass window. It was steel no doubt which did this, but he ventured to say they were hardly right in using their inventive powers for endeavouring to conceal a material and to make it appear something other than what it was, and giving almost invariably a sense of insecurity, and therefore of bad construction. He believed that they should rather give a full recognition to those new materials and turn their minds as far as possible to dealing with them in the most natural and, therefore, in the most artistic manner. They were proud of their English homes, and no one could be happy in a jerry-built house. It was true enough that they did not want the jerry builder, and yet they wanted to live in a cheap dwelling. It was to those present who were engaged in all departments of the building, from the architect who first conceived and designed, to the humblest worker who assisted in carrying out the design, that the public had to look for solving this knotty point, and in so solving it to bring happiness and contentment to millions of their fellow-creatures. He had the greatest pleasure in declaring the Exhibition open.

Mr. Fitzroy Doll (the Mayor of Holborn), in proposing a vote of thanks to Lord Windsor, said that he was glad of the opportunity of being present, not only as Mayor of Holborn, but as a member of the profession which from time immemorial had supplied to man his first want—a dwelling. It was a profession which found employment for an enormous number of men. As an architect, he sympathised with Lord Windsor in the office he held, for they all knew that of all offices that of the Office of Works was the one which was consistently starved as much as possible by the Government of the day. He always followed with interest the debates on the Budget, and he noticed that if it was possible to cut any vote at all it was the Office of Works that suffered. This must be very distressing to a man like Lord Windsor, with his artistic proclivities and his desire to see fine buildings in London and in the country. He could not understand this attitude of Parliament at all, because he would have thought that even the commercial side would appeal to men of high education, such as they were supposed to have in the House of Commons. When it was known that in Italy 11,000,000*l.* was annually spent by travellers who went there principally to see the fine buildings, he could not understand why the Government of England should show such parsimony in the matter of the erection of fine public buildings, and such buildings in any city always returned a high rate of interest in the number of visitors they attracted.

Mr. H. G. Montgomery, in seconding the motion, said that for the first time in the history of the Building Trades Exhibition the Agricultural Hall was absolutely full of exhibits. He had been connected with the Exhibition for about ten years, and when he came into it he determined that what were known as the side shows should not find a place. It had taken a long time to perfect the Exhibition, but no one could be able to say there was an exhibit this year which did not in some way or other appertain to the building industries. He had striven to get an Exhibition which architects would be willing to come to, and having got there would be prepared to do business, and they had that day bigger and better equipped stands in the Exhibition than they had ever had before.

The motion was carried, and Lord Windsor, in acknowledging the vote, said he had received a letter from Sir Aston Webb, who was prevented from being present owing to a Council meeting of the Royal Academy being fixed for the same hour.

A luncheon followed the opening ceremony.

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At the time of our visit to the Agricultural Hall on Wednesday, the Building Trades Exhibition justified its title of "International." It was the day before the formal opening, and the hall was like a huge workshop, in which the confusion of tongues resembled that at the building of the tower of Babel. French and Italian workmen were laying terrazzo floors and polishing marble mosaic; Germans were planning wood-block floors; Englishmen of diverse dialects were plastering and painting the stands, and unpacking and stacking their exhibits, and fitting their machinery; there were Scotsmen too, and also Irishmen. Vanloads of goods were driven into the hall, and after being emptied of their goods and litter were driven out again. To evolve order out of the chaos in one night seemed an impossible task. It was a task of equal or greater difficulty to make a detailed survey of the exhibition. Many of the stands were empty. Others were in process of construction. Some contained only a small proportion of the goods which ought to have been there. One bewildered workman, to excuse his meagre show, produced a telegram. "Cannot send the bricks to-day, too hot"; the kiln, he explained, had only just been drawn. Many of the exhibits were unnamed, and we did not see even one stand numbered. Worst of all, a catalogue could not be obtained for love or money. Through the energetic efforts of one of the secretaries, we obtained an advance copy, but this was at 9.15 p.m., after we had spent hours in the vain and wearisome effort to make one for ourselves. Why do exhibitors leave everything to the last moment? The date of the exhibition is known many months beforehand, and a little forethought would prevent all this final bustle and confusion. The result would be that the catalogues could be printed at the least one day before the formal opening of the exhibition, and fuller notices of the exhibition could be given in the *Builder* and other technical journals immediately after the opening. Let us explain more fully, in the hope that amendment may be made in the future. We go to press on Thursdays, and, unless the exhibits are on view the day before, it is impossible to notice them before our issue on the Friday in the following week, one day only before the closing of the exhibition. It seems strange that exhibitors will pay for their stands and take all the trouble of preparing an elaborate display of their goods, and yet do nothing to obtain the publicity which an early notice of the exhibition in the technical papers would bring them. Nor can we understand why, when an Exhibition is to be seen for only a week and a half, the promoters should choose to open it on so inconvenient a day as Thursday, the result of which, for a weekly paper like this, is that only a burried notice can be given the first week, and any more detailed notice can only appear just as the exhibition closes. If it were opened on a Monday instead of on a Thursday, there would be time for a careful and thorough review of it the same week, which by the present arrangement is rendered impossible.

For the reasons given above, we were unable on Wednesday to complete our survey of the exhibition, and in the absence of a catalogue and of numbers on the stands we could not visit the exhibits in numerical order. A cursory view sufficed to prove that this is the largest of the Building Trades Exhibitions which have been held in the Agricultural Hall, and, while many well-known firms are not represented on this occasion, there is, on the whole, an excellent and comprehensive display of building materials and fittings, together with a less complete but interesting show of machinery and plant used in the building trades. Stone, both natural and artificial, bricks and tiles, and sanitary ware, are perhaps the most conspicuous exhibits, and timber is also a prominent feature. Fire-resisting floors and partitions appear on many stands, and, although the names are different, most of them have a great family likeness. Joinery is fairly well represented, but ironmongery, apart from stoves and grates, is scarcely to be seen. There is not a large collection of sanitary fittings. In the classified index of the catalogue six firms only are given under the head of "Baths," but the list is far from complete; lavatories, sinks, urinals, and water-closets are not mentioned in the classification, although there are exhibits of these goods—perhaps they are included under "Bricks, Tiles, Terra-cotta, Sanitary Ware"; but it would surely be better to classify them together with baths under the head of "Sanitary Fittings," restricting the term "Sanitary Ware" to drain-pipes, traps, gullies, etc. There are about half-a-dozen exhibits of ventilating appliances, chiefly fans, and probably the same number dealing with heating apparatus, but the latter are not classified in the catalogue. The "Surveyor" section is supposed to deal specially with "Refuse Collection and Disposal," but out of forty exhibits in this section only four deal with refuse disposal and eight with refuse collection. The "Architect" section consists of architectural drawings, which are arranged in the East Gallery. There are also a large number of miscellaneous exhibits, which cannot be classified in a brief review, but there are very few indeed of the fancy bazaar type which is so conspicuous in "popular exhibitions." The Building Trades Exhibition is severely practical, and this is a feature worthy of commendation.

In the Entrance Arcade the most conspicuous exhibit is that of W. Oliver & Sons, timber merchants (Stands 2 and 3 and 15 to 21). Long and wide mahogany boards suitable for counter-tops are shown, together with figured mahogany, oak, walnut, pitch-pine, kauri pine, sequoia, and other woods of good quality. The Elkay Patent Bath Syndicate, now amalgamated with Cornes & Haighton (Leeds), show their ingenious steel and copper baths, which can be folded up into cabinets when not in use, the waste pipes being connected to the baths with flexible steel tubing. Babcock & Wilcox (Renfrew) exhibit at No. 6 some excellent models of their well-known water-tube boilers, as used in factories and workshops, fitted with their chain-grate stoker, and also of a water-softening and purifying plant (Oscar Guttmann's patent). The Library Supply Co. (Walthamstow) have a good display of office and library furniture made by them, including filing cabinets, on the card-index and vertical-filing systems, desks, and bookshelves; there are also specimens of oak panelling and other woodwork. On the opposite side of the arcade, at stands 9 to 12, W. & J. R. Hunter exhibit hardwood boards of various kinds and sizes, and, at the next stand, The Evertrusty Painting Machine Co. show three or four sizes of their lime-whitening machine, in which an air-pump is used to force the liquid through a hose-pipe fitted with a nozzle at the end; it can be used for lime-whitening, distempering, spraying disinfectants, and other purposes. According to the catalogue, T. Parker & Co. (at No. 14) have a collection of ladders, barrows, etc., and also a patent basket in which a wrought-iron rod is interwoven with the wickerwork, following the curve of the handle and passing down the sides and across the bottom in two lines. Crewe & Co. (Leeds), in the middle of the arcade, exhibit builders' hand-carts, street orderly carts, etc.

On entering the large hall, the first exhibit to the left is that of Cobbetts (No. 124), consisting of American timbers, turned balusters (round, spiral, and square), newels of commonplace type, "Marbut" machine-carved mouldings, three-ply panels, oak and maple flooring, etc. John Tann (No. 123) has a large show of steel safes, etc. Woodworking machinery is exhibited by J. B. Stone & Co. at the next stand, but this and other machinery exhibits will be described in another article. Crossley Bros. (Manchester), in addition to their gas and oil engines, show a gas-producer plant for producing coal-gas suitable for working gas-engines; the gas is produced at a very low cost, and can be used for generating electricity for country houses, and for other purposes. At No. 120 Yates, Haywood, & Co. have a large collection of wood mantels (some of which are of excellent design), cast-iron mantels, recessed-fire interiors, green faïence mantels and curbs, porcelain-enamelled iron baths, lavatories, and water-closets of the usual type, the "Quadrant" lifting-fire kitchener, and an ingenious self-setting range with lift-out oven, designed for artisans' dwellings.

The entrance to the Minor Hall adjoins

Stand No. 120, but the exhibits in this hall cannot be noticed until next week. We pass on to the wall-space under the side gallery. The first stand (No. 147) is occupied by the goods of Wilmer & Son; among these we may mention wood, marble, and iron mantels, Bond's patent fire with sunk hearth (recently described in our columns), enamelled iron baths, and iron stairs. The James Keith & Blackman Co. (No. 145) exhibit air-propellers (belt-driven and electric), Keith's sectional heating apparatus boilers, sectional radiators, etc.; a number of gas-fittings were also shown, fitted with special mantels and capable of producing a light of 300 candle-power at a cost (it is said) of one penny per hour for gas; the gas to be burnt is compressed by a special apparatus driven by water or electricity, and is forced through the small orifice in the burner at a high pressure; the system is in use on London Bridge and in Covent Garden Market and other places. Savage Bros. (King's Lynn) exhibit a motor waggon at an adjacent stand, and next to it (at No. 142) H. E. Gaze has an excellent exhibit of fibrous plaster decorations, including well-modelled figures larger than life, wood and compo mouldings, etc. C. & R. Light (No. 141) show American lumber of various kinds, and three-ply woods of various kinds for panels, drawer-bottoms, etc.; the middle layer is of whitewood, and the outer layers of birch, oak, or walnut. At 139A, James Robertson & Son (Fleetwood) exhibit a 5-ton steam waggon with hydraulic tipping arrangement.

Parallel to the exhibits just described are the stands in Row F, and in the bays adjacent thereto, the first being that of Partridge & Cooper (No. 100), and consisting of office furniture, vertical and horizontal filing cabinets, desks, chairs, etc. Jones & Roberts exhibit their patent automatic disinfector for fixing in the flush-pipes of water-closets, and also Fred Jones's new method of fixing lead soil-pipes; the latter is simple, the only special fitting being a cast-iron collar or bracket which is fixed to the wall; through this collar the soil-pipe is passed, and the joint is made by tafting back the upper end of the pipe on the curved surface of the collar, soldering a copper ring on, and then wiping the upper length of pipe on in the usual way; the collars are fixed as a rule 5 ft. apart, and a joint occurs at the alternate collars; flanges are wiped on at the other collars to give additional support to the pipe. At No. 102 J. & R. Nadin (Burton-on-Trent) display a number of drain-pipes, gullies, traps, etc., of the usual types in good glazed stoneware. The Aston Magna Brick & Tile Co. (Moreton-in-Marsh) show at No. 103 various specimens of their red pressed facing bricks, wire-cut bricks, hand-made roofing tiles (pressed and unpressed), finials, paving quarries, etc. Near this is the exhibit (No. 17) of Adamsez & Adams-Hydraulics; this includes some quaint and well-modelled pottery, glazed and unglazed (the glazed in various broken colours), lavatories, urinals, water-closets, etc., and large straw-glazed slabs for water-closet divisions, so designed as to be self-supporting; the closet-doors are hung to hooks fixed with screws to the slabs, so that wood or iron frames are not required; the glazed ware is of excellent quality. G. F. Braggins & Co. (Banbury) show a number of oak gates with adjustable and self-closing hinges and other fittings. R. W. Blackwell & Co. have a large exhibit of "Ruberoid" roofing, damp course, insulating papers, wrought-iron tubes and fittings, malleable and cast-iron fittings for steam, gas, and water pipes, pumps, tools, etc. W. J. Burroughes & Sons have a miscellaneous assortment of American baths, Canadian and American radiators, "Ideal" boilers, Dowsing electric radiators, lavatories, etc. H. W. Cullum & Co. (No. 20) show the "Kulm" fireproof partition slabs of pumice-stone and cement, the horizontal joints being formed with semi-circular tongues and grooves in the same manner as in many other partitions; nails can be driven into the slabs. At the same stand a builder's scaffold is shown, the poles of which are attached with the Bristol Wire Rope Co.'s flexible steel lashes instead of the usual ropes and wedges. A third exhibit contains samples of Joseph King & Co.'s (Stourbridge) plain and ornamental terra-cotta in light and dark grey, light and dark buff, and red, together with pressed and moulded bricks, etc. Matthews & Yates (Swinton) exhibit air-propellers and other apparatus, the most interesting being the "Cyclone" separator for collecting and conveying the sawdust, shavings, and chips from wood-working machinery, by means of an exhaust fan with tubes leading to it from the various machines. Arthur Koppel (Nos. 22 to 24) has a large display of contractor's steel tipping and other trucks, crane skips, concrete mixer with self-contained petrol motor, water softener (Froitzheim system), etc.

Turning again to Row F, we find, opposite the last-named stand, an exhibit (No. 119) of the Marland stoneware bricks made by the North Devon Clay Co. at their Marland Works (Torrington); the bricks are very hard and of a pale buff colour, and are used for walls, paving, etc. Other bricks are shown, at No. 116, by the Dodsdown Brickworks (Marlborough), including dark red sand-faced bricks and hard wire-cuts. At the same stand the Selby Brick Co. (Selby) exhibit glazed faience mantles in dark and light green, mazarin blue, and teapot-brown. No. 115 is the stand of Lyte's Metallic Woven Stair-tread Co. and Banner Sanitation Co.; the stair-tread is of plain steel wire and lead-encased steel wire woven together and then rolled so that the lead is squeezed into the meshes. The Banner Co. exhibit a new automatic flush-tank of novel design, the dome of the siphon being fixed by means of a spur at one end of a pivoted lever, to the other end of which a ball is attached; the water rising in the tank raises this ball and releases the spur; the dome is then suddenly raised by another ball, and the displacement starts the siphon; after the discharge, the spur and dome fall back to their original positions. Another novelty is a very handy drain-testing apparatus (known as the "Inferno") for use with smoke-rockets; it is fitted with an air-pump and indicator, and is in reality a combination of the pneumatic and smoke tests. The Somerset Trading Co. (Bridgwater) show a simple and unobtrusive interlocking roofing tile, known as the "Somerset"; the tiles measure 15½ in. by 8 in., and are fixed without nails, except at the verges; a single thickness is used except at the lap, and the quantity of tiles and weight of roof are, therefore, much less than in the case of ordinary tiles; finials, vases, etc., are also shown. Special mention may be made of the hand-made sand-faced bricks and roofing tiles exhibited by Thos. Pascall & Sons (Wrotham, Kent) at No. 113; there is a good variety of colour, and the texture of the tiles is equal to that of many old tiles. At the next stand there is a pitch-pine block floor laid by the Acme Paving & Flooring Co. on their well-known dowelled system. Powers & Deane Ransomes exhibit instructive examples of compound steel stanchions, girders, roof-principals, and other structural steelwork. J. Rooke (Kettering) shows specimens of Weldon stone, including an old stone from Kirby Hall, Northants, bearing the date MDCXC. and still in perfect preservation. Messer & Thorpe's patent bucket fire-extinguisher (No. 109) has a number of buckets telescoped into each other and submerged in a covered tank, so that each bucket is filled with water as it is lifted out. There was no name or number on the next stand, but the small buff paving-bricks are evidently the well-known Adamantine clinkers made by Towers & Williamson (Grantham). The next exhibit is a self-supporting brick partition with metal ties, made by the Fireproof Partition & Spandrel Wall Co. The Lyle Co. (No. 105) exhibit a number of well-made oak filing cabinets and card-index cabinets, made in sections, so that extra drawers can be added at any time without trouble.

In Row E the exhibit opposite the last is that of Stavers & Stavers (No. 99), and includes a number of screens or porches, doors, etc., which are left unpainted so that the materials and workmanship can be fully seen; more care has been bestowed on the designs than is usually the case in exhibits of this class. Mr. Sam Deards (Harlow, Essex) at No. 98 shows a small building covered with his "Superior" glass roofing; the bars are of steel, shaped like an inverted T, with projecting ribs along the ends of the flanges forming condensation channels; they may be enamelled, galvanised, or entirely covered with lead; the glass rests on the projecting ribs, and a lead capping is bent over the web of each bar to a point a little below the soffit of the glass, and turned up again and lapped over the glass at each side; the system has a general resemblance to some other patent glazing systems, but differs a little in some of the details. Carter & Co. (Poole) exhibit at No. 96 specimens of their tiles, faience, ceramic mosaic, terra-cotta, etc. Near this is the stand of R. Waygood & Co. (special position No. 11), at which are shown a hand dinner-lift with foot-brake, and an electric dinner-lift with push-buttons for starting and stopping, and with special shutters to the hatches, so that the lift stops automatically when any shutter is opened; the gearing for an electric passenger-lift is also shown. Another good exhibit of joinery is that of Samuel Elliott & Sons (Caversham), and includes a large number of balusters, many of which are well designed, oak and deal doors, panelling, mouldings, etc. Fenlon & Son (No. 94) show their gas bath-geysers fitted with a simple interlocking gear so that the gas cannot be turned on before the water or the water turned off before the gas; there is a separate tap for the pilot-light, and also an automatic dual valve; other specialities are gas-heated radiators, and a gas-heated boiler for greenhouses; the boiler itself is placed in the greenhouse, but the door-frame projects through the wall, so that the door opens outside. The combined exhibit of the Emdeca Metal Decoration Co. and the British Stamped Metal Co. is an interesting architectural feature; the structural portion by the latter company consists of stamped steel and copper columns and pilasters supporting an entablature with pediments, the mouldings being very true, with sharp arrises; the walls and ceilings are lined internally with Emdeca stamped and enamelled zinc, but nearly all the designs are imitations of tiling, with sham joints. Near this is the small building erected by the British Compoboard Co. (special position No. 5), showing the application of compoboard to walls and ceilings. Special position No. 4, near the last, is occupied by glazed bricks and hearth-curbs, sanitary ware, buff paving bricks and tiles and engineering bricks, fireclay flue-linings, terra-cotta, etc., made by Candy & Co. (Newton Abbot). H. J. & C. Major (Bridgwater) at No. 92 exhibit their special interlocking roofing tiles, and also ordinary plain red tiles, ridges, finials, malt-kiln tiles, bricks, etc. A small porch with walls of white gault pressed facing bricks (plain and moulded) and roof of plum-coloured tiles has been built at No. 90 by the Aylesford Pottery Co. (Maidstone). The Nostell Brick and Tile Works (Wakefield) exhibit at 88A a selection of their dark brownish-red bricks and tiles, finials, ridges, chimney-pots, etc.; the goods are hard and well burnt. Colthurst, Symons, & Co. (Bridgwater) show a variety of roof-tiles, including their patent interlocking and "Paragon" tiles, and also pressed plain tiles, together with ridges, finials, copings, bricks, etc. Near this is the building erected by Fred. Jones & Co. at special position No. 8 to show the "Hercules" partition blocks, coke-breeze concrete blocks, and composite blocks; the ceiling and "signboards" are of fibrous plaster, and various methods of applying silicate cotton will also be shown. Sissons Bros. & Co. (Hull) have erected a small and quaintly designed room for the purpose of displaying their Hall's washable distemper and "Sisco" white japan. The distemper tints are very pleasing, and special attention should be drawn to the canvas friezes painted in distemper; that inside the room has a conventional design of trees and flowers, and that outside represents a landscape at sunset, with distant mountains; the foreground and river are somewhat weak, but the general effect is good. The next stand (No. 86) displays red pressed facings and cherry-red sand stocks, ranging in thickness down to 1½ in., made by G. Tucker & Son (Loughborough). Other bricks, roofing tiles, etc., are shown by Watson Nelson (Napton-on-the-Hill, Warwickshire). At No. 84 there is a comprehensive exhibit of the Atlas artificial stone made by the Atlas Stone Co. (Cambridge); it includes balustrades in cream and red, an excellent flight of geometrical stairs, paving slabs, terrazzo paving, glass mosaic, etc. S. & E. Collier (Reading) have a large display of their roofing tiles, finials, etc., the most interesting to us being the hand-made sand-faced tiles, some of which are stained to give the broken colouring of old tiles; pressed and coloured bricks made of lime and sand are also shown, and are true and hard; among other things we may also mention their chimney pots, flower-vases, and pottery.

Among other exhibits of particular interest to architects and builders are those of the Ames Crosta Sanitary Engineering Co., the Columbian Fireproofing Co., J. A. King & Co., the Crittall Manufacturing Co., Art Pavements and Decorations, Diespeker, F. McNeill &

Co., the Gilmour Door Co., J. P. White, the New Expanded Metal Co.; G. M. Callender & Co., Dawson & Co., but these cannot be noticed in detail until next week.

## SOME AMERICAN CRANES.

THE Cleveland Crane and Car Company, of Wickliffe, Ohio, send us circulars—described as bulletins—of their cranes for various purposes. Bulletin "G" gives particulars of jib, post, and car cranes for use in machine shops, foundries, and on outdoor service, where work can be conducted within the range of the jib radius. Hand, steam, compressed air, water, or electricity can be applied as motive power on any or all of the motions. The framework of these types of crane is built of rolled steel sections or plate girder work. The top and bottom pivots are of steel rotating in roller bearings, the bottom pivot being provided with a step-bearing of bronze and steel. The "Armington" electric hoists are built by the same firm to meet the demand for a power hoist occupying very little space, but capable of handling large loads with ease and rapidity. These hoists, as well as the cranes mentioned above, are provided with automatic safety brakes, and, so far as we are able to judge from the illustrations and descriptive matter, all of them seem to be well designed and strongly built.

## CONCRETE BUILDING BLOCKS.

A NEW industry which has sprung up in the United States is the manufacture of concrete blocks for building purposes in place of brick and stone. When concrete began to be generally used for wall construction, the erection and subsequent removal of falseworks was found to be so expensive an item that the idea was developed of moulding the concrete into blocks, suitable for laying in the same way as bricks or blocks of stone. Then followed the further development of making the blocks hollow to reduce their cost and weight, and to render the walls drier and warmer. So rapidly has the industry grown that to-day numerous firms in all parts of the United States are engaged in the production of the new form of building material. The demand is so great and the profits are so alluring that many who have rushed into the business are inadequately equipped with the plant and practical knowledge necessary to insure success, and it is, unfortunately, the case that large quantities of very inferior material are being placed upon the market. The average purchaser cannot tell whether the blocks have been properly made, whether the raw materials were in accordance with standard requirements, or whether the correct proportions of cement and gravel were adopted by the maker. Hence a good many builders prefer to make the blocks themselves, either on the site of the building to be erected or in their works, as may be the more convenient.

At the present time there is no definite standard for the guidance of blockmakers as to the composition of the concrete used, the proportions adopted varying from four parts up to ten parts of ballast to one part of cement. As a matter of fact, the proportion of ballast should never be more than four parts to one part of cement for hollow blocks, or than six parts to one part of cement for solid blocks. The sand ought to be separated from the stones, and the correct proportion afterwards added, so that the cement and sand may fill the voids between the stones. Mixing should be performed by an approved machine, and moulding by a machine specially made for the purpose.

One of the most important details of manufacture is the seasoning of the blocks, for however carefully a block may be made it will be practically worthless if not properly seasoned. The first requisite in this process is plenty of water. The interval that should elapse after the block has been turned out and the commencement of sprinkling must depend upon atmospheric conditions, and may vary between three hours and eight hours. A good general rule is to apply water as soon as the colour of the outer surface begins to assume a lighter shade, and the blocks should be sprinkled afterwards as often as this effect is observed. After the blocks have been stacked in tiers, they should be sprayed with water from a hose for about a week.

Buildings of all kinds are now being erected of concrete blocks in almost every town and village throughout the United States, and in some cases with satisfactory effect from the æsthetic standpoint. In the case of a church recently built entirely of concrete blocks, a dark rock cement was used, giving a rich bluish-grey surface, closely resembling that of the local sandstone, and from which it could scarcely be distinguished. Some cements are certainly not calculated to make blocks of particularly pleasing colour, but by using a suitable facing material a fine smooth surface can be given, and, if all the blocks be made with cement of uniform shade, the general effect will be very similar to that of any ordinary building stone.

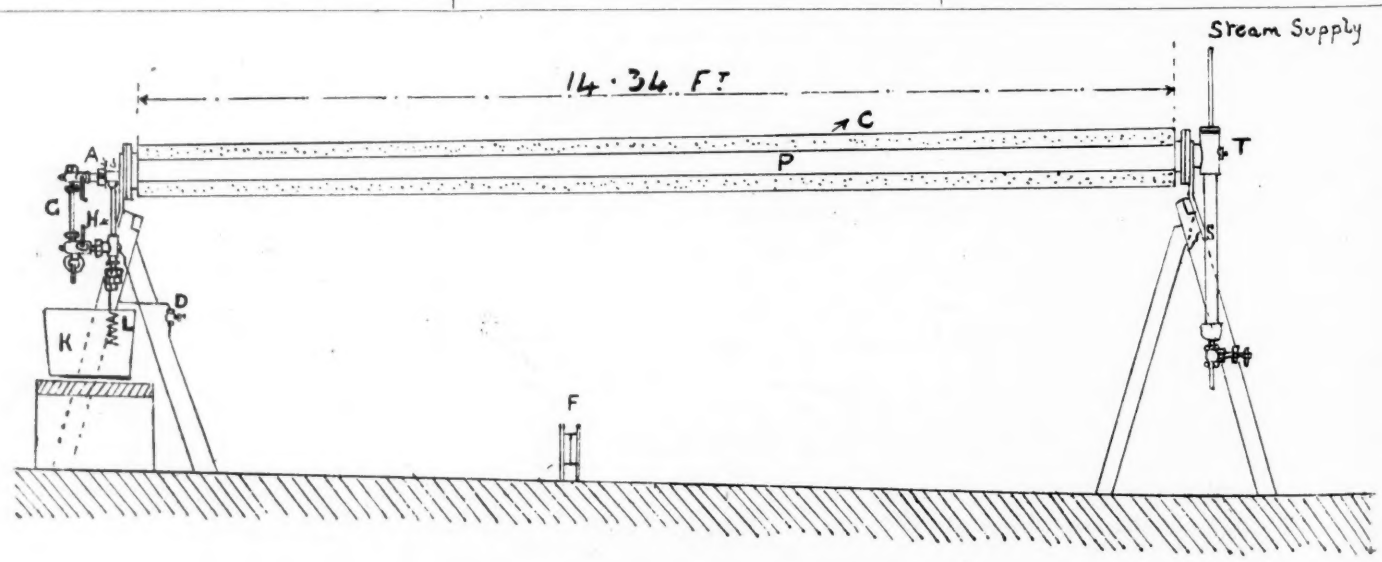
In America a great advantage offered by the blocks is that they are much cheaper than brick, stone, or timber, and, as they are far lighter in weight than cut stone, and considerably larger than bricks, the cost of laying is comparatively small. We do not suggest the cost of production in this country could be reduced sufficiently to offer any advantage in the ordinary way in respect of price over brick masonry, but there might be a saving in buildings of massive character, and the strength of the construction would be largely augmented. One important point is that most American fire offices are already quoting lower rates of insurance for concrete block buildings than for those of any other type. In Great Britain we are tolerably familiar with cement blocks as applied to the building of piers, breakwaters, and other engineering structures, and the new system is certainly worth the attention of architects.

## TESTS OF STEAM-PIPE COVERING.

SINCE the classical experiments of Péclet, recorded in his "Traité de la Chaleur," many tests have been made upon coverings of various kinds for steam pipes, some in this country, but more at various universities and colleges of the United States. A recent test of the "Wadnit" asbestos pipe covering is interesting as exemplifying the valuable facilities now afforded to the public by the National Physical Laboratory, and the results may be of service to steam users, although, of course, they do not in any way indicate the comparative value of the particular type of material examined.

The arrangement of the testing apparatus employed is shown in the accompanying diagram. The test pipe (P) was of steel, 4·47 in. external diam. and 14·34 ft. long, with flanges at the ends, and having a total radiation surface of 16·85 sq. ft. It was supported in a nearly horizontal position, with a slope of 6 in. in the length, to provide for the flow of condensed steam to the collecting pipe (H). The covering (C) is shown in section above and below the pipe. Steam was admitted through a separator (S) into the upper end of the test pipe, and the temperature of the steam was taken by means of the thermometer (T). Water of condensation in the collecting pipe was kept at a constant level during the experiments by observation of the gauge (G) and adjustment of the drain cock (D), the water being blown out through a coil (L) passing through the cooling tank (K) to prevent re-evaporation on reduction to atmospheric pressure. The figure also shows an air cock (A) at the lower end of the pipe. To permit correction to be made for the loss of heat from the flanges and auxiliary pipes, two flanges (F) similar to those on the pipe were fitted, after completion of the pipe tests, between the two ends of the apparatus in place of the test pipe. In this way the condensation due to the flanges and ends of the apparatus was determined separately. The observations made related to (1) the temperature of the steam, (2) the temperature of the outside of the covering, (3) the temperature of the air, and (4) the weight of the steam condensed.

The weight of water collected multiplied by the number of British thermal units representing the latent heat at the recorded temperature gave the total loss of heat from the pipe in B.Th.U. Deducting from this quantity the total heat lost through the flanges and ends, the net loss from the pipe itself was obtained.




*Apparatus for Testing Steam-Pipe Coverings.*

*REFERENCES:—*

P—Test pipe.
C—Covering.
G—Water gauge.
T—Thermometer.
S—Separator.
A—Air cock.
F—Flanges to replace pipe when measuring condensation in ends.
H—Collecting pipe.
D—Drain.
L—Cooling coil.
K—Cooling tank.

*DIMENSIONS:—*

Length of pipe, 14·34 ft.
Diameter of pipe, 4·47 in.
Surface of pipe, 16·85 sq. ft.

*Old Board of Trade Buildings, Whitehall (removed to make way for Soane's Building).*

This net loss divided by the latent heat gives the condensation in pounds in the test pipe alone.

The covering was in flat sections, about 3 ft. by 2 ft., which were wrapped round the pipe and laced with copper wire. The mean thickness of cover was 1.53 in., its weight being 2·0 lb. per ft. run, or 1·7 lb. per sq. ft. of external pipe surface. For the purpose of comparison, a test was also made with the bare pipe.

The following are the principal results as certified by Dr. Glazebrook, Director of the National Physical Laboratory :—

RECORD OF OBSERVATIONS.

| - | — | Covered Pipe. | Bare Pipe. |
|---|---|---|---|
| 1 | Temperature of Steam | 393·4 deg. F. | 392·7 deg. F. |
| 2 | Temperature of Cover | 103·6 deg. F. | — |
| 3 | Temperature of Air.. | 64·0 deg. F. | 67·7 deg. F. |
| 4 | Steam condensed per hour ..... | 6·245 lb. | 30·52 lb. |

CALCULATED RESULTS.

| — | Covered Pipe. | Bare Pipe. |
|---|---|---|
| Steam Pressure (gauge) ..... | 215 lb. per sq. in. | 213 lb. per sq. in. |
| Latent Heat ..... | 837 B.Th.U. per lb. | 837 B.Th.U. per lb. |
| Difference of Temperature (Steam and Air) .... | 329·4 deg. F. | 325 deg. F. |
| Total Loss of Heat ..... | 5,225 B.Th.U. per hour. | 25 550 B.Th.U. per hour. |
| Loss Due to Flanges and Ends..... | 2,245 ,, ,, | 2,170 ,, ,, |
| Net Loss Due to Pipe ..... | 2,980 ,, ,, | 23,380 ,, ,, |
| Condensation from Pipe..... | 3·56 lb. per hour. | 27·9 lb. per hour. |
| Condensation from Pipe per sq. ft. ..... | 0·212 ,, ,, | 1·66 ,, ,, |
| Loss per sq. ft. per deg., Difference of Temperature | 0·54 B.Th.U. per hour. | 4·27 B.Th.U. per hour. |

From the foregoing results the following table has been prepared by Dr. Glazebrook, the air temperature of 70 deg. Fahr. being assumed:—

HEAT LOSS AND CONDENSATION IN BARE AND COVERED PIPE OF 4-IN. INTERNAL DIAMETER. AIR TEMPERATURE=70 DEG. FAHR.

| Steam Pressure (gauge). | Loss in B.Th.U. per sq. ft. per hour. | | Steam Condensed per sq. ft. per hour. | |
|---|---|---|---|---|
| | Covered | Bare. | Covered. | Bare. |
| lb. per sq. in. | B.Th.U. | B.Th.U. | lb. | lb. |
| 190 | 168·4 | 1,339 | 0·200 | 1·59 |
| 200 | 170·6 | 1,357 | 0·203 | 1·61 |
| 210 | 172·7 | 1,373 | 0 206 | 1·64 |
| 220 | 174·6 | 1,389 | 0·209 | 1·66 |

This table shows that the saving due to the pipe covering in question should be equal to 87 per cent. of the total condensation taking place in an unprotected pipe. While the results are clear as to the usefulness of this particular material, we should now like to hear of tests under the same conditions upon the numerous other types of pipe covering in daily use.

In connexion with this subject we notice that some very similar trials were made a short time ago for the purpose of a thesis by two students at the Iowa State College, U.S.A., and the data then obtained are more useful because the investigation was made with steam at pressures ranging from 20 lb. to 100 lb. per sq. in., upon nine different makes of non-conducting material, including asbestos air cell, asbestos sponge, and 85 per cent. magnesia coverings. The condensation for various pressures in the unprotected pipe was : 20 lb., 398 B.Th.U. ; 40 lb., 480 B.Th.U. ; 60 lb., 565 B.Th.U. ; 80 lb., 624 B.Th.U.; and 100 lb., 678 B.Th.U. We have calculated these figures for ready comparison with those given by Dr. Glazebrook. It is interesting to note that the saving of steam in the protected pipe ranged from 76 per cent. to 89·5 per cent. for the nine coverings tested, the average saving being nearly 82 per cent.

COX & CO.'S BANK, CHARING CROSS.—Mr. H. Ling is appointed architect for the additions about to be made to the banking-house at Charing Cross, at an estimated cost of some 2,000*l*. The premises, No. 16, Charing Cross, were designed by Ewan Christian for Messrs. Cox & Co., who removed thither from Craig's-court seventeen years ago.

PROPOSED ZOOLOGICAL GARDEN FOR ABERDEEN.—A scheme for a small zoological garden and aquarium for the suitable accommodation of the animals and birds at present housed in Duthie Park is under consideration of the Links and Parks Committee of the Town Council of Aberdeen. The City Architect, Mr. Rust, has been instructed to bring up a report and plan embodying the suggestions made by Professor Thomson.

## OLD BOARD OF TRADE BUILDINGS, WHITEHALL.

THESE are the buildings which stood on the site now occupied by the Treasury Buildings, on the west side of Whitehall. They were removed to make way for the block of building designed by Sir John Soane, and subsequently altered to its present design by Barry.

## *ARCHITECTURAL SOCIETIES.*

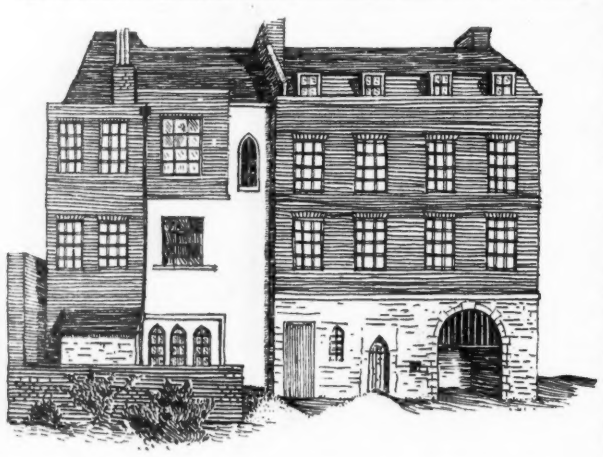
GLASGOW INSTITUTE OF ARCHITECTS.—The annual general meeting of the Glasgow Institute of Architects was held on the 18th inst. in the rooms of the Institute, at 187, Pitt-street, Mr. John Keppie, President, in the chair. The annual report stated that the number on the honorary roll was eight, and the number on the ordinary roll seventy-one. It was resolved to give the Institute prizes in future as follows :—3*l*. 3s. for the best general work and attendance ; 2*l*. 2s. for the best work in measuring class, Technical College ; 2*l*. 2s. for the best work in drawing class of School of Art. The tenth triennial competition for the Alexander Thomson travelling studentship will be held this year, and the drawings are to be lodged with the Secretary by December 28, 1905. The report was adopted, and the Council for the ensuing year was elected as follows :—Messrs. A. N. Paterson, John Keppie, Horatio K. Bromhead, James Lindsay, T. L. Watson, James M. Monro, Alexander M'Gibbon, A. Balfour, Charles Gourlay, Thomas Baird, jun., R. D. Sandilands, James K. Hunter, J. M. Crawford, George Bell, Alexander Skirving, and David Barclay. The Treasurer's accounts, which were submitted and approved of, showed that the funds were in a satisfactory position. A meeting of the newly-elected Council followed, at which office-bearers for the year were appointed, viz. :—President, Mr. John Keppie, F.R.I.B.A. ; Vice-President, Mr. James M. Monro ; Auditor, Mr. David Barclay, F.R.I.B.A.; Secretary and Treasurer, Mr. C. J. MacLean. The various committees for the year were also appointed.

EDINBURGH ARCHITECTURAL ASSOCIATION.—This Association paid a visit on the 22nd inst. to Drum House, Gilmerton, permission for which had been granted by Colonel More Nisbett. Mr. Hamilton More Nisbett, architect, acted as leader of the party, and explained that the house is supposed to have been the work of the elder Adam. It was built about 1724, and was an early example of fully developed Palladian style in Scotland. The grandeur of the front, compared with the meanness of the other elevations, was characteristic

of the time. Attention was drawn to the stone detail of the front elevation, the leadwork, which was rare in Scotland, and the interior plaster work executed by Italians. At the conclusion of the visit Mr. H. O. Tarbolton, President of the Association, proposed a hearty vote of thanks to Colonel More Nisbett and to Mr. Hamilton More Nisbett.

## OLD "QUEEN'S TREASURY," WHITEHALL.

THIS is a curious bit of old Whitehall, drawn from a sketch made by Mr. W. E. Drummond-Milliken. It is rather strange to think that such a building was standing within the precints of Whitehall only twenty years ago.



*River Front of "Queen's Treasury," Whitehall: formerly the Beer Buttery with Watergate. Pulled down in* 1884.

## *ENGINEERING SOCIETIES.*

THE INSTITUTION OF CIVIL ENGINEERS.—At the Annual General Meeting of the Institution of Civil Engineers, held on Tuesday, the 18th inst., Sir Guilford Molesworth, President, in the chair, the result of the ballot tor the election of officers was declared as follows:—President, Sir Alexander Binnie; Vice-Presidents, Dr. Alexander B. Kennedy, Mr. W. R. Galbraith, Mr. William Matthews, C.M.G., and Sir Leader Williams; other members of council, Colonel W. P. Anderson (Ottawa, Canada), Mr. C. Napier Bell (Wellington, New Zealand), Mr. B. Hall Blyth (Edinburgh), Mr. C. A. Brereton, Mr. R. Elliott-Cooper, Colonel R. E. B. Crompton, C.B., Mr. W. J. Cudworth (York), Dr. G. F. Deacon, Dr. F. Elgar, Mr. Maurice Fitzmaurice, C.M.G., Mr. R. A. Hadfield (Sheffield), Mr. G. H. Hill, Mr. C. W. Hodson, C.S.I., Mr. J. C. Inglis, Mr. G. R. Jebb, Sir William Thomas Lewis, Bart. (Aberdare), Mr. A. G. Lyster (Liverpool), Sir Charles Metcalfe, Bart. (Cape Town), Sir Andrew Noble, Bart., K.C.B. (Newcastle-on-Tyne), the Hon. Charles A. Parsons, C.B. (Wylam-on-Tyne), Mr. A. Ross, Mr. A. Siemens, Mr. J. Strain (Glasgow), Sir John I. Thornycroft, Professor W. C. Unwin, B.Sc., Mr. A. F. Yarrow. The Council have made the following awards for papers read and discussed before the Institution during the past session:—Telford gold medals to Lord Brassey, K.C.B., and Mr. C. S. R. Palmer; a George Stephenson gold medal to Mr. Lyonel E. Clark; a Watt gold medal to Mr. J. F. C. Snell; Telford premiums to Messrs. L. F. Vernon-Harcourt, M.A., R. W. Allen, and William Marriott; a Crampton prize to Mr. A. Wood-Hill; and the Manby premium to Mr. E. D. Pain. The presentation of these awards, together with those for papers which have not been subject to discussion and will be announced later, will take place at the inaugural meeting of next session.

THE CARNEGIE TRUST, DUNFERMLINE.—In their first annual report the trustees state that the bonds transferred to the Trust by Mr. Carnegie in November, 1903, have yielded a first twelve months' income of 21,812*l*. The trustees intend to erect an art gallery and museum, and to provide a central and branch libraries. The baths and gymnasium will shortly be ready for use, and a part of the interior of the house at Pittencrieff is now adapted as a "shelter" from cold or inclement weather.

# Books.

*Specifications in Detail.* By FRANK W. MACEY. London: Crosby Lockwood & Son. 1904.

THE hope expressed in our review of the first appearance of this book has not been realised in the new edition, which now lies before us, in spite of the revision and enlargement claimed for it in the terse preface. Like other spheres of human activity, building methods are in a state of constant change, and during the six years' interval in the two issues of this publication much progress has been made in all matters concerning builders' operations. But "Specifications in Detail" remains very much where it was—that is to say, is now in fundamental respects "out of date." Nor are the "Constructional and Practical" sides of the subject kept in view in the diagrams and descriptions which go to make up this large and important work.

Like some other kindred text books, this volume appears to be largely based upon previous literature. A work of this importance, dealing with the specifying ot current materials and methods, should teem with the feeling that it is written directly from actual buildings and processes. The character of the illustrations does more perhaps than the descriptive text to convey this idea of backwardness. It is only possible now to give a few references to the many instances where we consider revision necessary. In the drainage of a stable horse pots are shown and specified, and iron surface channels have brief reference, but no mention is made of channels in the actual flooring, and the word *granolithic* is not to be found in any of the 620 pages.

Hollow walls are indicated in a manner which would render such precautions against dampness futile in every way, and the whole reference is too brief. The illustrations are copious, and, as such, should be complete, but in many cases damp courses are not shown in walls, bonding stones omitted from new ashlaring facing to old walls, the rolls of lead flats shewn parallel with joists instead of with boarding, and wasteful substance in the panels of internal panelling is indicated. The diagrams of heating systems are antiquated, coils being everywhere described, and fittings such as radiators and sectional boilers are almost entirely absent. Metal lathing, amongst other current systems, finds no place in the work, rough cast is dismissed in a few words, and, what is of great importance to present-day constructors, ferro-concrete and its use has no reference whatever.

A great deal is expected of the architect, who is to inspect all framing of timber, and direct where and when all plant and materials are to be deposited or removed. The contractor, again, is required to do impossible things in estimating for items "not specifically mentioned in detail." There is much that is unnecessary and much that deserves greater detail, though we may be grateful for special reminders in regard to matters sometimes overlooked. Many clauses appear to belong to the conditions of contract, whilst others would be better if left to the bill of quantities, but, taken as a whole, there is, as we remarked in our notice ot the first edition, much that is excellent and useful to the architect, but of this second edition we regret that no material advance is made in a work for which there is a demand.

*Le Abitazioni Popolari.* (*Case Operaie.*) EFFREN MAGRINI. Milano: Ulrico Hoepli. 1905.

THIS small volume treats of the housing ot the working classes; it is divided into two parts, theoretical and practical. The first part discusses the requirements of artizan's dwellings, and the second part shows what has been done to meet these requirements. To an English reader the interest centres in the first part rather than in the second; for the plans are defective and the elevations uninspired. The book opens with an historical account which points out that the movement began in France, though England was the first country to legislate on the subject. As early as 1764 a private enterprise, viz., the Compagnie de St. Gobain (which now owns 1,500 dwellings) started building cottages for its workpeople, but it was not till 1894, 130 years later, that the State gave its attention to this question. On the other hand, our Parliament took up the subject in 1851, and we had ten years' start over the Belgians. Denmark and Brazil were the next to follow suit, while Austria, France, and Germany delayed their legislation till the nineties. The recently constituted Italian State has had so much to occupy it that it waited till May 31, 1903, to pass its first law relating to workmen's dwellings, building societies, etc., though such societies had previously existed.

The Società di Assicurazione Popolare-Vita instituted an inquiry as to the desirability of erecting artizans' dwellings in towns; and the tabulated results form interesting reading. Out of 105 reports, nearly one-half declare that workmen's houses are urgently needed. Of ten answers in the negative three come from towns where co-operative building societies already exist; three from small towns where many dwellings can be had at low rents; two from mediæval cities whose population has greatly diminished, viz., Mantua and Pistoia; while two lucky little towns of 5,000 inhabitants have had dwellings built for them by the employers of labour, *i.e.*, the contractors for the Simplon tunnel at Domodossola, and the local wool manufacturer at Borgosesia. This table gives also the yearly rent per room, the cost of building per room, and the price of ground per square metre. Rent varies from 1*l*. in towns of 5,000 inhabitants to 5*l*. in Naples with its 500,000 inhabitants. Building ranges from 20*l*. to 40*l*. per room in small towns; and land costs from 6d. to 8s. per square metre, except in the old capital cities. Under these conditions, it is considered that building societies are certain to pay.

The second or practical part is less interesting, because to us, less instructive; though two points call for our most careful attention. The first is the categorical advice that 5 to 10 per cent. of dwellings should have at least four bedrooms, to provide for families with more than six or eight children. No stress has been laid on the second point, and this is one that English architects should take especially to heart, *i.e.*, the provision of cellars and store-rooms. We quite realise the fact that a labourer with a family should have not less than three bedrooms; but which ot us thinks of arranging for an apple-store in the roof—and who would have the courage to give a cellar to a tiny cottage? We may smile at the primitiveness of the plans (collected from all countries), where generally only two bedrooms are provided—as likely as not one giving access to the other; but the ever-present "cellar," or "store," remind us that our standard of comfort is not the only one. It is interesting to see how many foreign manufacturers provide dwellings for their workmen, notably the gun factories of Krupp and Creusot; and we are sorry that not one of our industrial villages is represented. This is the more to be regretted as, out of 150 illustrations drawn from many sources, two English plans are the only ones which show any skill in their arrangement.

*Resistenza dei Materiali e stabilità delle Costruzioni.* Ing. DR. GUIDO SANDRINELLI. Milano: Ulrico Hoepli. 1905.

THIS little handbook, dealing with resistance of materials and stability of structures, is an enlarged and carefully revised edition of the manual of the same title compiled by the late Pietro Gallizia.

Dr. Sandrinelli has endeavoured to eliminate from the older publication all extraneous matter, and to present original arguments in a clearer and more practical form. He has further condensed material produced by numerous other authors, and added a judicious selection of fresh matter in order to bring the publication up to date. The author recognises that the principal characteristic of science lies in its ever enriching itself with new elements, which result from a more exact comprehension of fundamental principles.

Consequently this manual deals with much matter that scientists have recently added to the theory of elasticity, in its application to the resistance of materials. The book also contains a large number of tables, useful in practice, and carefully drawn up. Tables of

logarithms, natural sines, square and cube roots, comparative weight and strength of materials, etc. These are easily referred to, and readily furnish data for the various and rapid calculations needful in practice.

Altogether, the book, though not so complete as some of our pocket manuals, should answer its purpose, and provide a concise and practical guide for those engineers and architects who are fortunate enough to work on the decimal system.

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*Great Masters in Painting and Sculpture: Gaudenzio Ferrari.* By ETHEL HALSEY. London: George Bell & Sons. 1904.

IN this volume of the "Great Masters" series Miss Halsey gives a very interesting account of the life and work of Ferrari, the "acknowledged head of the Lombard school" in the early part of the XVIth century. Ferrari's fame has suffered on account of an appreciable deterioration in the work of his later years, most of which is to be found in Milan, where the masterpieces of other painters, more especially Leonardo da Vinci, completely eclipse any product of his brush. But in the quaint old-world towns of Lombardy—Vercelli, Varallo, or Novara—his art reigns. Here, indeed, are to be found his finest pictures, all at once deeply religious and intensely dramatic. Miss Halsey rightly insists on Ferrari's dramatic sense and "feeling for vitality," for it is undoubtedly due to these qualities that his work contains so much that is delicately beautiful, so much that is supremely human.

In her preface the author makes mention of a German element to be found in Lombardy, and so in Ferrari's art, and in the second chapter of the book she draws attention to the various influences which were brought to bear upon him. These are important, for although Ferrari nowhere fails to stamp his individuality upon his work, yet it is not difficult to distinguish the various phases through which he passed, together with their precise significance. Primarily an outcome of the old Milanese school, he afterwards threw off its yoke, only, however, to succumb later to the not wholly beneficial effects of the Renaissance. His first master and friend, Luini, whilst undoubtedly Italian in characteristics, "seems to have used his influence in directing his young pupil's attention chiefly to the works of Borgognone and Bramantino," masters of whom the former most probably introduced into Italy Flemish or German ideas—"a certain northern temperature," as Pater suggests—and Ferrari even in his later work shows that he has not forgotten early lessons. So in his great fresco in the church of Santa Maria delle Grazie at Varallo there are traces of a desire for a solidity almost barbaric, certainly not Italian. As Miss Halsey says in a detailed account of this work, "He employs gesso for the armour and trappings, but his love of modelling makes him occasionally exaggerate its use, as in the picture of the Crucifixion, and his happiest results are in the scenes where paint is the only medium used." This use of gesso to raise part of the picture is essentially northern in its origin. Yet there is nothing of this in such a picture as the "Madonna and Child" in the church of San Cristoforo at Vercelli, one of Ferrari's most beautiful works, where the "scheme of light and shade is distinctly Correggio's." If Luini's influence on the whole was one of restraint, Correggio's served to give an effect of confusion, and it may be that this largely brought about the decadence of Ferrari's last years, when "his touch coarsens, his colour scheme becomes crude and fiery, and the movement of his figures violent and exaggerated." Leonardo da Vinci's influence is slight except in isolated instances, such as the "Last Supper" in the sacristy of the cathedral at Novara.

Such works as the altar-piece in the church of San Gaudenzio, a Pietà now in a private gallery in Milan, and the "Journey to Calvary" at Canobbio show Ferrari in the height of his career, while in his last great masterpiece, the "Choir of Angels" in the dome of the church of Santa Maria dei Miracoli at Saronno, his extraordinary power of expressing activity has succeeded in producing "a busy throng animated with a holy joy." As the author justly remarks, "we marvel at the astonishing vitality of movement, and it almost seems that we *hear* the bustle of this swarm of angels." Some of the figures appear to be the work of Ferrari's pupils, though this cannot altogether spoil the grand beauty of the whole. Miss Halsey is happy in her description of this, as in those of the painter's other most important works. We would suggest, however, that her consistent use of Ferrari's Christian name is uncalled for; the master was and is known to the majority as Ferrari, not as Gaudenzio.

The book before us is illustrated with some forty reproductions, including a fine one of the "Holy Family," now at Dorchester House, and, indeed, practically the only important example of Ferrari's work in Great Britain, the "Christ Rising from the Tomb" in the National Gallery probably being largely the work of Della Cerva, one of Ferrari's pupils. A copious bibliography, a chronology, and an exhaustive catalogue of the master's works add value to a book which shows every sign of careful and earnest work.

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*Old Cottages, Farmhouses, and other Stone Buildings in the Cotswold District.* By W. GALSWORTHY DAVIE and E. GUY DAWBER. London: B. T. Batsford. 1905.

THIS volume is the outcome of the success which attended the publication of its forerunner and companion volume, entitled "Old Cottages and Farmhouses in Kent and Sussex." Mr. Dawber's personal acquaintance with the Cotswold district, in which, by the way, he has done much delightful domestic building, specially fits him for writing the introduction and explanatory notes to Mr. Galsworthy Davie's excellent photographs. Such a collection of photographs published in this form are invaluable records. They show buildings, unique of their kind, which are not valued just now at their worth. The unfortunate result is that they year by year decrease in number, too often to be replaced by inferior building both in design and of materials unsuitable to the district. Such a book draws attention to these changes and is helpful in forming a healthy public opinion in favour of the old houses, their appearance and manner of building. The photographs, eighty-six in number, are enhanced by the eighty-six plans, diagrams, and sketches by Mr. Dawber. The buildings are all of the native stone, gabled, roofed with stone or with thatch, and with chimneys which are always made a charming feature of the house. The date of the work shown varies from the end of the XVIth century to about 1700—broadly speaking, 1580 to 1690. The plans invariably show a house one room in thickness, which of course entails passage-rooms which would not be tolerated at the present day. The modern architect has more complicated conditions to face than those of the XVIth century, and it is therefore more difficult for him truthfully to attain the quiet and simple lines of the old houses which we so much admire. An analysis of the eighty-six illustrations shows a surprising similarity of features. The methods of expression are few; repetition is continually relied upon, with results neither tedious nor dull; the illustrations show a period of building in one district characterised throughout by breadth and simple dignity. The work both for its illustrations and its analysis is a valuable volume to all interested in domestic architecture and is very tastefully got up by the publisher.

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*The Artistic Crafts Series: School Copies and Examples.* Selected by W. R. LETHABY and A. H. CHRISTIE. London: John Hogg. 1904.

AT first sight the collection of drawings opening this series of School Copies and Examples is somewhat startling. The explanatory note to the series, however, shows the purpose that the reproductions are intended to serve. They are in the nature of a counterpoise to the usual school copies. The authors consider "it has been too much the habit in drawing copies to sacrifice the beauty of the example to some theory of method in instruction, as balance, clearness of outline, and so on." It is their purpose "on the other hand, to put fine suggestive and useful material before the student, so that he may at once have drawing copies of a real kind, standards of excellence, and examples of historical art, which should stir his imagination and suggest the very purpose of art." The present portfolio contains facsimile enlargements of woodcuts and prints; two from woodcuts from Bewick, a leopard and a tiger; an engraving of about 1540 of Raphael's Apollo, and two woodcuts from early Italian books; a useful alphabet of Roman capital letters of the XVIth century; two examples of flower drawing from "Flora Londinensis"; two copies of ornamental capital letters; the earliest form of the English Coat of Arms; and an old English ship of war of Armada times from a tapestry. It is not suggested that the copies should necessarily be literal, but in various methods; they are, in short, not to supplant the study of nature, but to stimulate the imagination in its representation. The illustrations of William Curtis's "Flora Londinensis" have probably never been excelled, nor Bewick's woodcuts of quadrupeds and birds, but it is only after a careful study of nature and the difficulties of representing her by draughtsmanship that their excellencies become apparent to the student. Were a student to base his work only on that of other men, their faults would be liable to be magnified, and their good points lost sight of, but in the case of craftsmen, for whom these drawing copies are primarily intended, the old methods have a special significance and value.

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*Ham House: its History and its Art Treasures.* By MRS. CHARLES ROUNDELL. London: Geo. Bell & Sons. 1904.

THIS is a splendid publication in its way, but it is wrongly entitled, since it is not a history of Ham House but of the people who owned it and who lived there in successive generations. There is no index to the book; and as far as we have been able to discover there is not even any mention as to who actually built Ham House, or the date of its erection; nor is there any plan of the house. The book is really a sumptuously bound and illustrated family history.

The numerous and very fine plates, however, furnish, along with the text, a valuable record of the interiors and of much of the pictures, furniture, and other works of art in this peculiarly interesting mansion "of more than Italian luxury," where after an interval of two hundred years every article of furniture in the State Apartments occupies its original position, and every picture hangs in its old place.

Illustrations of the exterior and of the hall and the principal rooms are given as separate plates, and all or many of the family portraits by Vandyck, Lely, Kneller, Jansens, Hoppner, and others. The most interesting architectural point in the interior is the treatment of the gallery round the upper part of the hall, which, instead of following in parallel lines the shape of the hall, has an oblique bend towards each end, making the gallery a kind of long-shaped octagon; the effect is very good, as those who have been over the house will remember.

Among the pictures illustrated is the fine bust portrait of Vandyck by himself—as magnificent a gentleman in his style and *tournure* as any of the society celebrities of the day whose portraits he painted. Among the furniture illustrated in the plates is the splendid "Italian-Chinese" cabinet in carved ivory, a sumptuous piece of work on a rather unusual style. There are reproductions also of some of the fine bindings in the library, and of pages of two books printed respectively by Caxton and de Worde.

The authoress has procured the assistance of two experts, Mr. W. Y. Fletcher and Dr. G. C. Williamson, to describe and comment on the contents of the Library and the Miniature Room. She would have done well if she had also secured the assistance of an architect to describe the house and to furnish a plan of it. To give a so-called history of a great house without any statement of its architectural origin and without any plan of it is, from our point of view, an absurd omission; but probably the majority of those who would purchase such a book care very little about this.

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*Augsburg: Eine Sammlung seiner Hervorragendsten Baudenkmäler.* Augsburg: Kutscher & Gehr.

*Düsseldorf und Seine Bauten.* Düsseldorf: L. Schwann. 1904.

THESE two books in illustration of the architecture of Augsburg and of Düsseldorf are produced under the joint supervision of the Architectural and Engineering Societies of the respective cities; but they are very different in scope and in the pains which have been taken over their production. The Augsburg book is simply a collection of illustrations reproduced from photographs, without either text or plans. It gives a kind of collective illustration of the city architecture, commencing with a view of the town hall, a square and bald piece of architecture, effective only from its great height and size. The view of the Jakoberstrasse seen through an archway is effective, and the collection of

photographs gives a general idea of the architecture of the city. The Düsseldorf volume is a very different affair. It is a fully-written history of the city, every illustration of a building is accompanied by its plan, and sections of the principal churches and other buildings are given; there are also plans of the whole city at different periods of its history. It is an admirable descriptive and illustrative record, which does the greatest credit to the two local Societies concerned in its publication. The only fault we have to find is that it is printed on that heavy leaded paper against the use of which we have several times protested. Not only is the shiny surface of this paper disagreeable to the eye, but the result is that this is the heaviest volume for its size that we have ever handled; though only octavo size, it can hardly be read without a desk or a rest to hold it.

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*English Metal-Work.* Ninety-three drawings by W. TWOPENNY (1797-1893). London: Archibald Constable & Co. 1904.

THESE are reproductions from a portfolio of pencil drawings in the British Museum, one of a set by W. Twopenny, an antiquary who added to the love of old work the power of drawing it. The illustrations are beautifully drawn and show an excellent discrimination in choice of subject; their author had an eye for what was best in mediæval work which was most unusual at the date at which he worked. It forms a most interesting and valuable repertory of illustrations of mediæval metal-work, including a good many things which are still not familiar in published illustrations. It would have been just as valuable without Mr. Lawrence Binyon's preface of exaggerated and sentimental laudation, accompanied by the sneer at mere architects' drawings which is a part of the stock-in-trade of the contemporary art-critic. When made by architects, he tells us, "such drawings are always apt to be bald and cold and tame." Apparently Mr. Binyon is not acquainted with such publications as the Architectural Association Sketch-book. Mr. Weaver's short notes on the various drawings are suggestive and to the point.

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*The Royal Insurance Company's Building, Liverpool.* London: B. T. Batsford.

THIS is a folio volume *de luxe* in illustration of a fine building, of which Mr. J. Francis Doyle is the architect, Mr. Norman Shaw having been the "advisory architect," and having had, we should imagine, some part in or influence on the design. It gives a set of exceedingly fine photogravures of the exterior and various interiors of the building, and also a reproduction of the working drawing showing the unusual and clever steel trussing by which the upper floors are made entirely self-supporting, the ground floor being left unencumbered by piers for the offices of the Insurance Company. The book is edited by Mr. J. Newby Hetherington, who we presume furnishes also the written text. It forms a fine and monumental addition to an architectural library.

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*The Alhambra.* By ALBERT F. CALVERT. London: Geo. Philip & Son. 1904.

THIS, as far as the writing is concerned, is only a popular or what may be called a drawing-room book, beautifully bound and got up; but it is sumptuously illustrated, and it has a value to architects in this sense, inasmuch as it contains fine reproductions, on a smaller scale, of all the coloured prints of the decoration produced in Owen Jones's book on the Alhambra. These, and the other numerous illustrations and plans, render it a valuable volume, as it comprises complete illustrations of the Alhambra, though on a rather small scale.

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*Old Houses in Edinburgh.* Drawn by BRUCE HOME. Part I. London: S. Bagster & Sons. (In progress.)

THIS work, which is to be complete in about sixteen parts at a shilling each, forms a publication both of antiquarian and artistic interest. This part contains only three plates, which we presume is to be the number for each part; but they are plates exceptionally good both in printing and in the original drawing and execution. Many of the old houses which are to be illustrated in this publication may very likely not survive much longer, and the preservation of their appearance in good illustrations is therefore all the more valuable. Such an old house as that called "Lady Stair's House" (and which we note is said to be now "in process of alteration") seems like a part of the history of old Scotland, enabling us to realise the better the aspect and character of even the happier lives (and Lady Stair's is said to have been such) in that disturbed and turbulent period. The short accounts of each plate are printed in a fine bold type, decorated with large finely designed initial letters in black line; the whole make-up of the publication is in keeping with its subject, and it is certainly a wonderful shillingsworth. Professor Baldwin Brown contributes a brief introduction.

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*A Catalogue of Zodiacs and Planispheres.* By the REV. A. B. GRIMALDI. London and Edinburgh: Gall & Inglis. 1905.

THIS is a small book which represents a great deal of labour and research. The author has catalogued more than 1,400 representations of zodiacs and planispheres represented on inscribed stones, coins, and drawings or engravings. Brief descriptive notes are given with each, together with a reference to the place or book where they may be found. The catalogue must be of the greatest use to anyone studying this curious and fascinating subject.

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## *COMPETITIONS.*

CLOCK TOWER, ST. GEORGE'S CIRCUS, S.E.—The premiums in this competition have been awarded as follows:—First, design No. 12, Mr. J. F. Groll, 18, Turner-buildings, Millbank Estate, Westminster, S.W. Second, design No. 31, Mr. Leslie Wilkinson, 3, Ravensbourne-gardens, Ealing, W. Third, design No. 4, Mr. Alexander Peacock, 31, Brownlow-terrace, Finchley, N. One hundred and six designs were received. Messrs. Thomson & Pomeroy were the assessors.

CHURCH, EPSOM.—The general committee appointed to carry out the proposed new Parish Church building scheme met at the Public Hall recently, and it was reported that the President of the Institute of Architects had been asked to nominate an assessor, and the committee had confirmed his nomination by appointing Mr. Fellowes Prynne. The Chairman said that the committee in consultation with Mr. Prynne had decided to invite seven gentlemen to compete, and their names were:—Messrs. Temple Moore (Westminster), Nicholson & Corlette (Lincoln's Inn), C. H. M. Mileham (Lincoln's Inn-fields), W. H. Bidlake (Birmingham), Charles Spooner (Chiswick Mall), and two local gentlemen, Messrs. J. Bannister and J. Hatchard Smith. The Chairman also read out conditions and instructions (drawn up for the meeting's approval) for the competing architects. These set forth that the building was to accommodate about 1,000 people, exclusive of the choir: that the cost, including lighting, heating, seating, architect's fees, clerk of works expenses, and cost of tower and spire, should not exceed 14,500*l*. The action of the Building Committee in appointing only two Epsom architects was criticised. The reply was that the competition was a limited, not an open, one and that 20*l*. was to be paid to each architect for preparing plans. A motion that two more Epsom architects be allowed to compete was defeated on the casting vote of the Chairman, and the Building Committee's Report was adopted.

# Correspondence.

## HEATING BENEATH THE FLOOR.

SIR,—I notice in the description of the Chapel of King Edward VII. Sanatorium, in your issue for April 22, that the method of heating the floor from beneath is "a novelty in this country"—meaning, I suppose, England.

I think not; I thus warmed and kept dry the floor of the Manchester Tennis Court in 1879—I think that was the date of its building; and, unless I am much mistaken, Mr. Bodley warmed the whole floor of the nave of his beautiful Church of St. Augustine, Pendlebury, near Manchester, at, or perhaps a little prior to, the date above given.

GEO. T. REDMAYNE,
Architect.

# Illustrations.

## PROPOSED BUILDING AT THE EAST END OF THE MALL.

THIS is the design by Sir Aston Webb, exhibited at the Royal Academy and referred to in our first article in this issue, for a building to form an entrance to the Queen Victoria Memorial Processional Road, and to connect the Mall with Charing Cross.

In regard to the intention of the design, Sir Aston Webb writes:—

"This building is required for the further accommodation of the Admiralty, and will be used partly as offices and partly as residences for the First Lord and First Sea Lord.

"In the original design for the junction of the Mall and Charing Cross a large circus had been arranged, but it being found necessary to occupy a portion of the site for building, the same idea has been retained with a smaller circus. This arrangement has the additional advantage of closing the vista both from the Mall and the Strand with an important building and screening the change of axis of the two roads, while it also shuts out the view of the commercial buildings and advertisements at present seen from the Mall.

"The plan clearly shows the proposed arrangement. The new building will be connected to the present Admiralty buildings by a bridge on the first floor and also by a subway, and will be faced throughout with Portland stone."

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## THREE DESIGNS FOR HOUSES.

THE three houses illustrated in this issue, one of which is in prospect only and the other two carried out, are all by one architect, Mr. Ernest Newton, and the drawings are all exhibited at the Royal Academy.

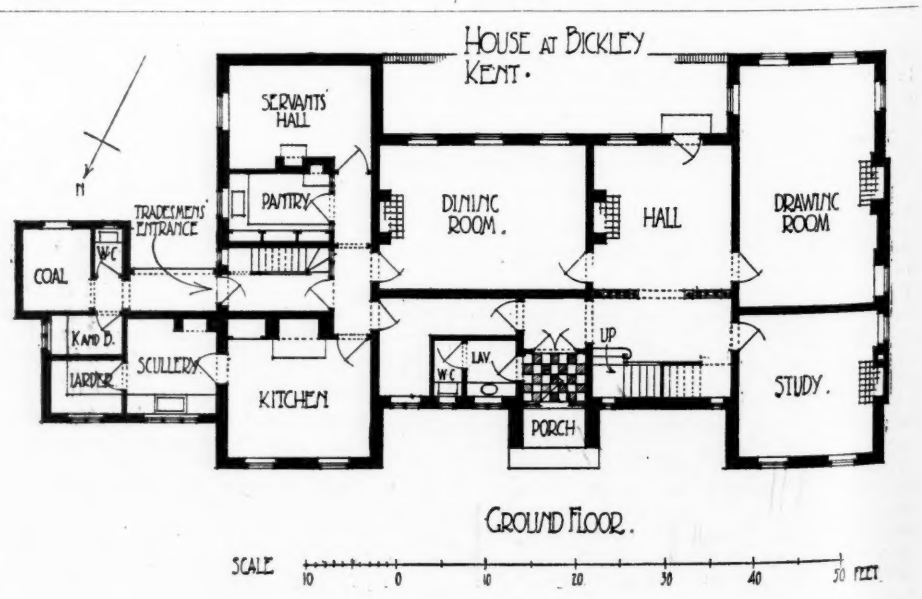
Mr. Newton gives us the following notes on the three illustrations:—

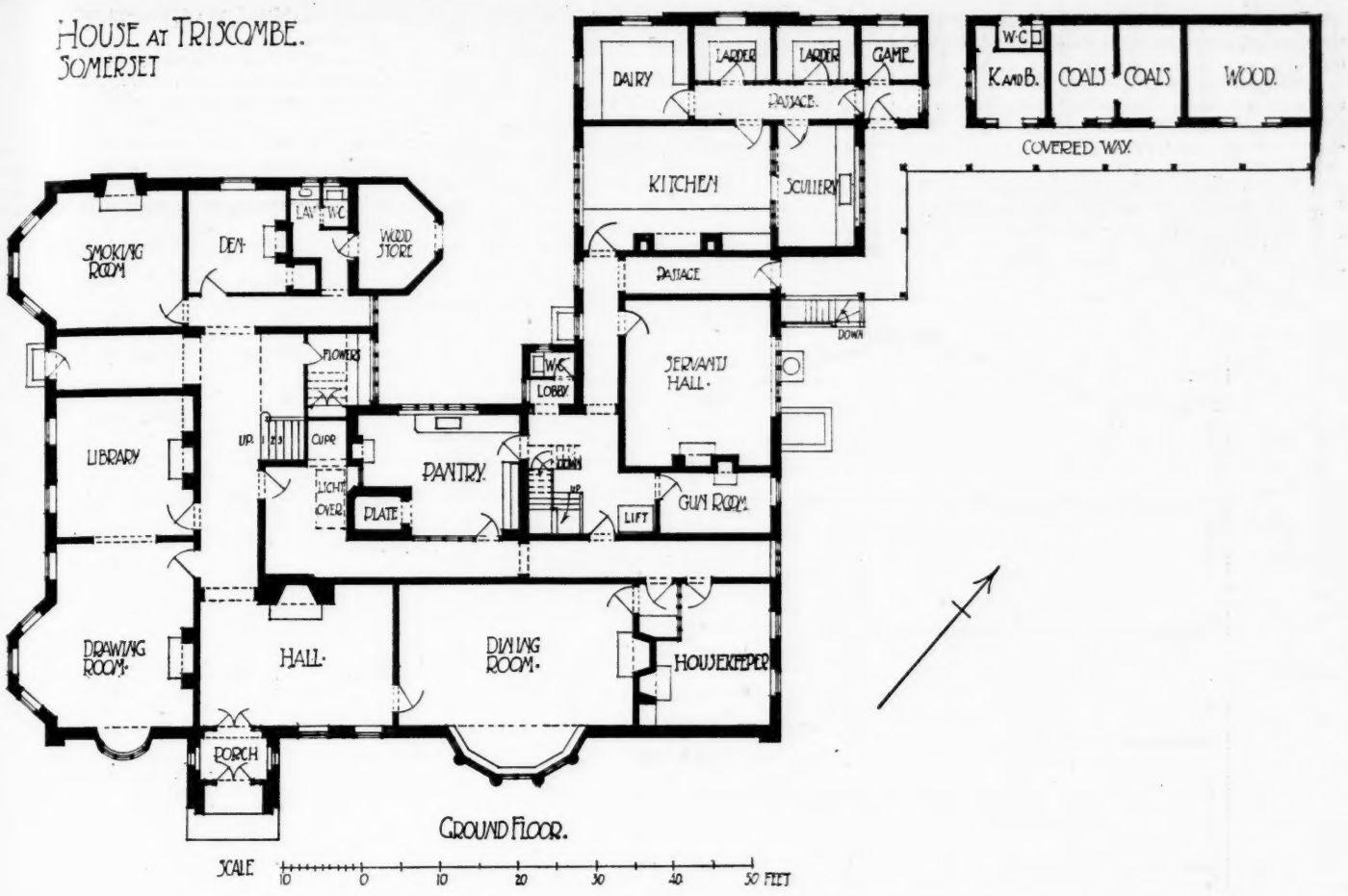
### PROPOSED HOUSE AT REIGATE.

This house has not yet been built. The intended materials are red brick and tiles, the bays covered with cast lead between the heads of the ground floor windows and the cills of the first floor windows.

### HOUSE AT BICKLEY.

This house is built in Bickley Park, and occupies part of the grounds of Bickley Hall.






It is built of red brick, and the roof is of dark red hand-made Wrotham tiles. The builder is Mr. P. F. Duthoit, of Bromley, Kent.

HOUSE AT TRISCOMBE, SOMERSET.

This house is built at Triscombe, between Taunton and Minehead. As the position is exposed, the building has been kept low, and the walls all covered with cement rough cast. The roof is covered with thick selected green slates of mixed colours, which vary from green to deep orange. The house, stables, lodge, and cottages have been built by Mr. Henry Pollard, of Bridgwater. Mr. Webber has acted as clerk of works. All the lead glazing and casements are carried out by Messrs. Burt & Potts, and the heating and hot-water work generally by Messrs. Crispin, of Bristol.

## BOOKS RECEIVED.

WIEN: AM ANFANG DES XX JAHRHUNDERTS. Redigiert von Ingenieur Paul Kortz. (Gerlach & Wiedling, Vienna.)

# The Student's Column.

## TYPICAL STRUCTURES IN CONCRETE-STEEL.—XVII.

### BUSINESS PREMISES IN SOUTHAMPTON.

THE building illustrated in the accompanying series of drawings was erected during last year, from the designs and under the superintendence of Messrs. Poole & Sons, while the concrete-steel construction was executed under the direction of Mr. L. G. Mouchel, M.Soc.Ing.Civ. (France), agent-general for the Hennebique patents in Great Britain. This structure was designed to serve the purpose of a drapery business, and is situated in East-street, Southampton.

Owing to the restrictive character of the Southampton building regulations, which, like the London Building Act, demand certain specified wall thicknesses without making allowance in any way for the physical properties of the material employed, the outer walls of the structure were built in brick, with the addition of masonry in the form of cornices, mullions, and balustrades.

Notwithstanding this limitation, the building serves very well as an illustration of the advantages offered by reinforced construction, as the whole of the interior work—including columns, column foundations, floors, partition walls, and staircases, as well as the roof—is of concrete-steel, and columns of the same material are also incorporated in the outer walls.

The principal façade, which is on East-street, has a length of 40 ft., the other façade on the Strand having a length of 47 ft. The building includes four stories exclusive of the basement, the height being 64 ft. from foundation level to the top of the flat roof and 69 ft. to the top of the mansard roof. Above the latter is a storage tank of circular form constructed in concrete-steel, the tank having a mean diameter of 5 ft. 6 in. and a depth of 2 ft. 9 in., outside measurements.

On the Strand frontage two openings are provided, as shown in Figs. 118 and 119, giving access to the basement, the larger opening for merchandise and the smaller one for coals. It is unnecessary to devote space to a description of the exterior walls of the building, the disposition and relative thickness of which are made sufficiently clear by the basement plan, Fig. 118, and on the ground floor plan, Fig. 119. We may mention in passing that the footings consist of concrete and are 5 ft. wide by 2 ft. deep. The broken lines along the street frontages and the party wall lines in Fig. 118 indicate the outside edge of the foundation course, of which two sections will be observed in Fig. 117.

Fig. 118 shows the arrangement of the interior columns and the areas of their bases, which are of the general construction illustrated by Fig. 39 on p. 526 in our issue of November 21, 1903. Typical outline sections of the bases are included in Fig. 117, by which it may be seen that the slope of the upper surface is varied according to requirements, but the uniform thickness of 12 in. has been adopted as a minimum. In every case the lower surface is at a level of 4 ft. 6 in. below the basement floor.

For the five thin columns incorporated in the brick walls of the building the foundations measure 6 ft. square by 1 ft. 9 in. deep at the centre, tapering down to 12 in. deep at the edges. Of the five interior foundations (see Fig. 118) three measure 6 ft. square by 1 ft. 6 in., and 12 in. deep at the centre and edges respectively; one, which has to afford support for a large and a small column, has a length of 7 ft. 8in., a width of 6 ft., and thicknesses of 1 ft. 3 in. and 12 in.; and the last, which supports a small column near the back of the premises, measures 4 ft. square, and has maximum and minimum thicknesses of 1 ft. 6 in. and 12 in. respectively.

The five columns in the exterior walls are necessary for the reinforcement of the brick-work, so as to afford adequate support for the concrete-steel bressummers carrying the walls and masonry over the window and door openings on the ground floor. It was necessary to make these columns of the smallest possible cross-sectional area and with a minimum thickness. In consequence of this requirement, they were designed so as to measure only 7 in. thick by 18 in. wide.

The calculated load upon each of these slender columns is about 116,500 lb., and as the cross-sectional area is only $7 \times 18 = 126$ sq. in., the load is approximately 925 lb. per sq. in. The height of the basement is 10 ft. = 120 in.

By calculating the safe load for a cast-iron column of equal length and cross section, it will be found that the load actually carried by each of these concrete-steel columns does not compare at all unfavourably, especially when the relative weights of the materials are taken into account. Of course, much depends upon the basis of the calculation and the factor of safety allowed.

If it be assumed that the ends of the cast-iron column are rounded or jointed, the computed result will be much smaller than that calculated upon the assumption that the ends are rigidly fixed.

Rankine's formula giving the value for (P) the breaking load for round-ended columns is :—

$$P = \frac{fS}{1 + \frac{4}{c}\frac{l^2}{r^2}}$$

or, calculating per square inch by omitting the factor (S), which represents the sectional area of the column :—

$$P = \frac{f}{1 + \frac{4}{c}\frac{l^2}{r^2}}$$

The value of Rankine's co-efficients for cast iron are :—

$f = 80{,}000$ lb., $c = 3{,}200$.

The value of $r^2$, the square of the least radius of gyration, is $h^2 \div 12 = 49 \div 12 = 4$, approximately; and as in the present example $l = 120$ in., the breaking load per square inch would be :—

$$P = \frac{80\,000}{1 + \frac{4 \times 14{,}400}{3{,}200 \times 4}} = \frac{80{,}000}{5{\cdot}5} = 14{,}545 \text{ lb.}$$

Employing 8 as the factor of safety, the safe load becomes $14{,}545 \div 8 = 1{,}818$ lb. per sq. in.

This is just about double the actual load on the concrete-steel columns in the Southampton building.

If we assume the ends of the cast-iron column to be rigidly fixed, the resistance would be :—

$$P = \frac{f}{1 + \frac{l^2}{c \cdot r^2}}$$

$$P = \frac{80\,000}{1 + \frac{14.400}{3.200 \times 4}} = \frac{80\,000}{2{\cdot}125} = 37{,}630 \text{ lb.}$$

Again adopting 8 as the factor of safety, the safe load becomes 37,630 ÷ 8 = 4,704 lb. per sq. in. (nearly).

Thus, in one case the safe load for the cast-iron column is just about double that for the concrete-steel column, and in the other it is a little more than five times that for the latter.

But taking into account the relative weights for the two materials, the comparison becomes much more favourable for concrete-steel. The weight of cast iron being 450 lb. per cubic ft., and that of concrete-steel about 150 lb. per cubic ft., the safe loads for equal weights would be as follows :—

| | Per sq. in. |
|---|---|
| Concrete-steel column .. .. .. | 925 lb. |
| Cast-iron column, ends rounded .. | 606 „ |
| „ „ „ fixed .. | 1,568 „ |

Thus we see that weight for weight the strength of the concrete-steel column is nearly three-fifths of a cast-iron column, even when the ends of the latter are assumed to be rigidly fixed.

Comparison with a rolled-steel column

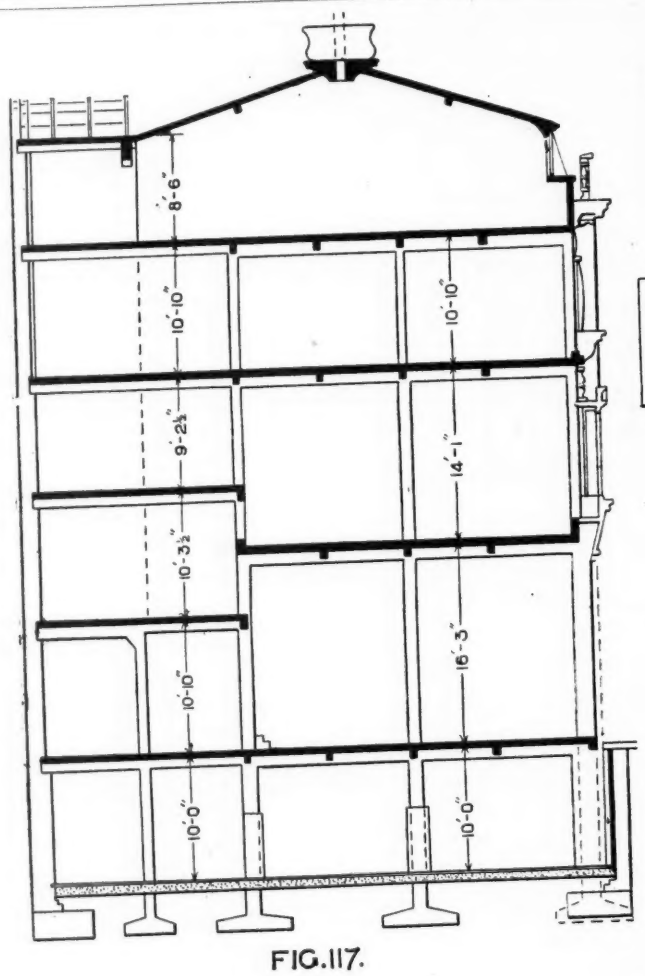



FIG. 117.

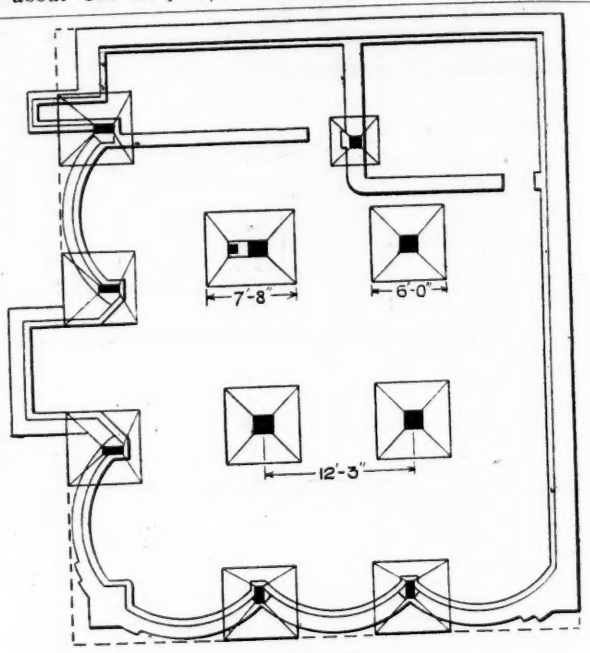



FIG. 118.

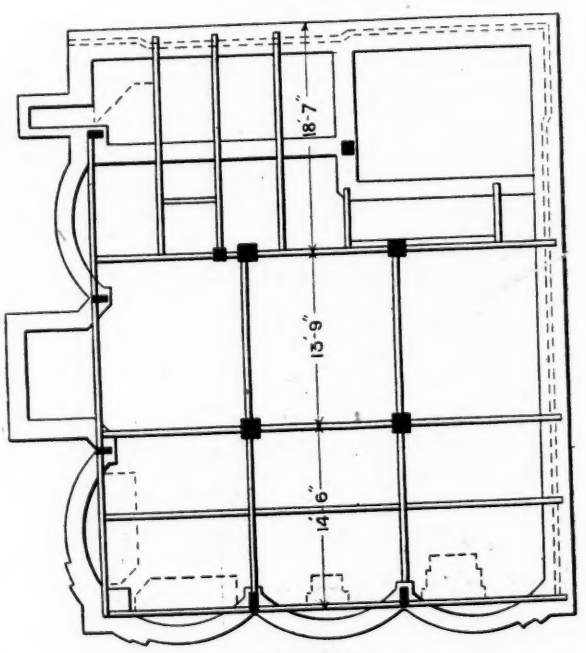



FIG. 119.

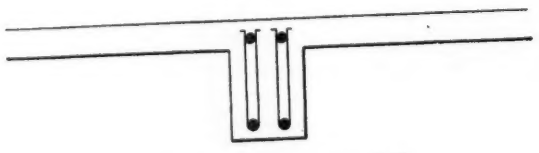


FIG. 120. Section A.B.

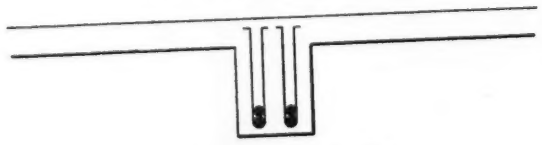


FIG. 121. Section C.D.

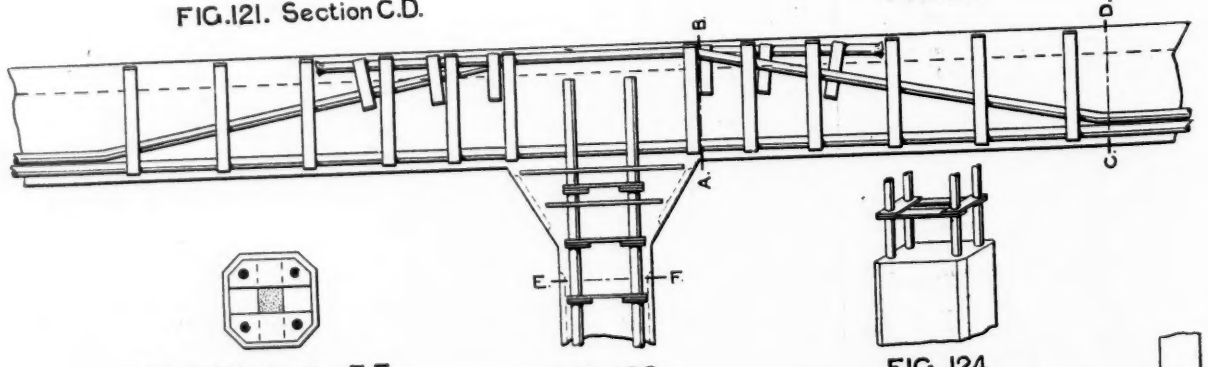



FIG. 122.



FIG. 123. Section E.F.



FIG. 124.

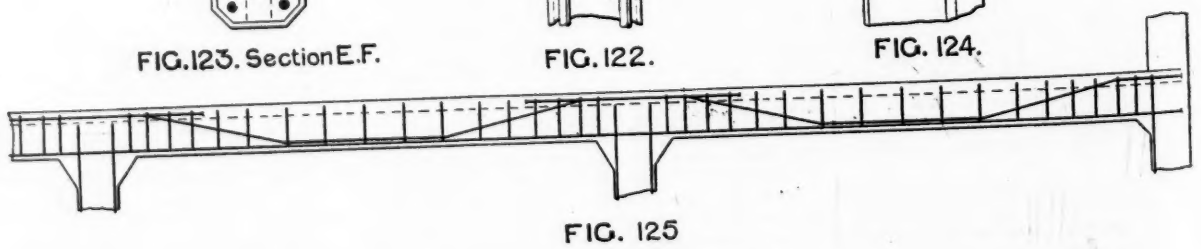


FIG. 125

*Illustrations to Student's Column.*

would place concrete-steel at much greater disadvantage, but it must be remembered that in the case of independent columns the steel would require most adequate protection against the effects of fire, and, although the transverse dimensions of the metal itself might be considerably less than that of concrete-steel, the outer covering of fire-resisting material would probably reduce this disadvantage to a very considerable extent, besides adding largely to the total cost of the work.

The four principal independent interior columns of the building at Southampton are of square section, as shown in Figs. 118 and 119, and of the construction illustrated in Figs. 122, 123, and 124. The dimensions commence at 14 in. square in the basement and diminish to 8 in. square at the third floor. The total load carried by each column is about 200,000 lb., equal to 1,020 lb. per sq. in. of sectional area.

It would be interesting to make calculations for comparing concrete-steel with cast iron in the case of these columns. This time, however, we will make an approximate computation by the table of hollow cast-iron columns given on p. 425 of vol. lxxviii.

The height of the 14-in. square portion of the concrete-steel columns is 120 in. Allowing $2\frac{1}{2}$ in. on each side for fire protection, we have 9 in. square as the available dimensions of a cast-iron column, in which length ÷ diameter = 120 ÷ 9 = 13·3. The value for this ratio by the table is, say, 59,000 lb. for a square column, this being the breaking load per sq. in. Dividing by 8 to give the same factor of safety as before we get 59,000 ÷ 8 = 7,375 lb. This is the safe load per sq. in., and the requisite area of metal is 200,000 ÷ 7,375 = 27 sq. in. This makes the area of the hollow inside the column 7·35 in. square, and the thickness of metal 0·825 in., or nearly $\frac{7}{8}$ in.

Therefore the 14-in. square concrete-steel column is equal in strength to a 9-in. square hollow cast-iron column with sides about $\frac{7}{8}$-in. thick, and the final dimensions of the latter after the addition of fire-resisting material would be very similar to those of the concrete-steel construction.

An additional element of strength is afforded in the case of concrete-steel by the secure connexion of the longitudinal reinforcement with the concrete of the main beams, and by the monolithic character of the entire work.

Fig. 119 is a plan of the ground floor showing the arrangement of the beams, typical sections of which will be found in Figs. 120, 121, and 122. Fig. 125 is another typical section giving a general idea of the continuous-girder construction embodied in the floor system. The span of the main beams on the ground floor is 13 ft., the cross section of these beams being 9 in. deep by 7 in. wide, and the thickness of the intervening floor slab is 4 in. The calculated superload for this floor was 168 lb. per sq. ft.

On the first floor the span of the main beams is 13 ft., the section of the beams 9 in. deep by 8 in. wide, and the thickness of the floor slab $4\frac{1}{2}$ in., the calculated superload being 280 lb. per sq. ft.

On the first and second mezzanine floors (see Fig. 117) the superload was calculated at 112 lb. per sq. ft., and the floor slab is 4 in. thick. At the first mezzanine floor there are two concrete-steel bressummers 15 in. deep by 14 in. wide, which carry one of the 14-in. exterior brick walls from this level up to the roof, as well as part of the roof load and the weight of some of the other floors. On the second mezzanine floor part of the floor system is designed on the cantilever principle, being carried on a beam which in turn is a cantilever supported by some of the other main beams.

For the second and third floors the superloads were calculated at 224 lb. per sq. ft., the main beams measuring 9 in. deep by 7 in. wide, and the floor slab $4\frac{1}{2}$ in. thick.

The roof is constructed entirely in concrete-steel without intermediate support, and consists of concrete-steel principals with a span of 37 ft., connected by a roof slab of the same material. The staircase from the ground floor to the roof is entirely of concrete-steel, being very similar in construction to staircases described in previous articles.

THE ELECTRICAL STANDARDIZING INSTITUTION.—It is announced that the new premises, 66-70, Southampton-row, London, will be completed and ready for the reception of students for the summer term on Monday, May 1.

## ART-TRADE SCHOOLS IN GERMANY.

DR. FREDERICK ROSE, British Consul at Stuttgart, recently added another to his many interesting and valuable reports on educational matters. His present paper treats of "Art-Trade Schools in Germany." After some introductory observations, in which he assumes that the movement for the foundation of such schools dated from the Great London Exhibition in 1851, he points out that the first country to profit by the lessons inculcated by that event was the United Kingdom, where the creation of the Department of Science and Art and the South Kensington Museum mark the earliest systematic attempt to place the art-trade industries of the country upon an independent national basis, and to promote and control their development. The means adopted towards this end included the formation of collections of representative products of the art-trade industries, the holding of lectures on art, industrial art, and technology, the foundation of instruction workshops, the extension of instruction in drawing and modelling, the public recognition of distinguished work, and other measures. Germany was not slow to profit by the United Kingdom's example, and her art-trade schools and museums founded during the latter half of the past century have followed British models to some extent; at the same time, however, they have been founded and developed upon the basis of the educational views prevailing in Germany, one of their distinguishing features being the promotion of intimate relations between the aims of the schools and the needs of the local and district art-trade branches of industry.

The number of art-trade schools founded in Germany up to the present is twenty-seven. They are generally divided into preparatory classes (Vorklassen), and special classes for the different branches of art-trades (Fachklassen). In many cases evening continuation classes for general subjects of instruction and for special instruction in art-trades are attached, evening and Sunday schools for drawing being also found. The instruction in the art-trade schools is given, to a great extent, in the daytime, and the connexion between the day and evening classes of the same institute—where such exists—is sometimes of a loose, sometimes of a more intimate character, having been gradually determined by local requirements, financial conditions, gradual development, and other considerations. Where the art schools are combined with drawing and artisans' schools a much larger amount of evening instruction is given.

The instruction in the preparatory classes includes drawing of ornaments from charts and plastic examples, drawing and painting of objects from the animal, vegetable, and mineral worlds, modelling of ornaments and figurial objects, knowledge of projection, shading, anatomy, history of art, methods of drawing instruction, and so forth.

The special classes only admit pupils who have already acquired a certain measure of preliminary artistic training either in the preparatory classes or elsewhere. They are often attached to studios or instruction workshops (Lehrwerkstälten), and are generally divided into several principal groups accordingly as they devote special attention to architecture, sculpture, or painting, and the multifarious branches of petty art. Their number is not fixed, but additional workshops and studios are added from time to time according to the development and requirements of the art trades in the towns in which the schools are situated or in the surrounding districts. The departments and classes generally include architectural drawing, chasing, engraving, wood-carving, decorative painting, pattern-drawing and designing of all descriptions, enamelling, art-metal work, etc.

The development of the German art-trade schools is still progressing, and, as many of them are still in the first tentative, experimental stage of their existence, the details of their internal equipment and organisation are consequently by no means settled. It is most noteworthy that they closely observe and study British methods and equipments of art-trade instruction, and adopt without reserve whatever they find adapted to their own conditions and environment.

Art-trade instruction in Germany is by no means confined to the art-trade schools. Certain branches of art trades are taught in special schools of a separate, independent nature, which generally confine themselves to instruction in one particular branch. In this connexion the special schools for the ceramic industries, the schools for the wood-working industries, and the schools for special branches of the metal industries may be mentioned. A certain amount of art-trade instruction is also imparted in the building-trade schools, and in the architectural faculties of the technical universities.

The general aim of the art-trade schools is briefly the application of art to industry, the endeavour to impart the methods and develop the faculties for the utilisation of the graceful and harmonious in Nature in the production of the ordinary practical objects of trade and daily use. To durability and serviceability, the two cardinal principles necessary in the production of goods, are to be wedded grace of form and harmony of colour. The art-trade worker must not be a mere mechanical producer of useful wares, but must imbue his work with the sense of the beautiful drawn from the measure of his own talent, and his contemplation and interpretation of the great book of Nature. It may also be observed that the art-trade schools stand on a higher artistic level than the combined art-trade and artisans' schools. They stand in closer connexion to pure art, and endeavour to train technical artists (technische Künstler), not art-skilled artisans (kunstfertige Handwerker). The art-trade schools also endeavour to give their instruction in the daytime to full-time pupils, whilst the combined art-trade and artisans' schools lay greater stress upon evening instruction. Dr. Rose proceeds to give a description of the individual schools and their detailed work. As an example, we quote some of the particulars furnished respecting the establishment at Mainz, which our author places first in his list.

The art-trade school at Mainz is connected with an artisans' school, and an evening school for drawing and modelling. It was founded in the year 1841 as an artisans' school (Handwerkerschule), and was given a few rooms in a Carmelite convent. With the aid of the proceeds of some small industrial exhibitions and private munificence, a special school building was erected in 1878, to which various additions were made in 1884, 1888, and finally in 1903, the last-mentioned being on a very large scale. The art-trade school was separated from the artisans' school in the year 1879, with the name of "Public Drawing Hall," and was given a special curriculum and Director; in the year 1894, however, they were again united under the management of one Director.

The instruction in the art-trade school is given during the day, with a few hours in the evening in special cases. The instruction in the artisans' school is given in the evenings and on Sunday mornings. The instruction in Department II.—for workmen engaged in building and for decorative painters—is given during the day, but only in the winter months.

The art-trade school, developed in the course of time from local requirements and conditions, aims at imparting the necessary artistic knowledge and ability for the successful prosecution of the various branches of the art trades of Mainz and the surrounding districts. It aims more especially at imparting that measure of special knowledge which cannot be adequately acquired during the ordinary terms of apprenticeship in the art-trade workshops; for this reason a suitable period of previous practical work is necessary for entrance to the schools, and pupils without this qualification who have passed through the preparatory classes are required to remedy this deficiency by undergoing a period of practical work before entering any one of the eight special art-trade divisions. In pursuance of the general aim of the school the multifarious branches of the art-trades have been combined and reduced to eight special divisions, and special drawing courses have been arranged for general art-trade draughtsmen, furniture designers, building draughtsmen, decorative painters, wood-carvers, modellers, workers in artistic door fittings, goldsmiths, chasers, engravers, persons engaged in the ceramic industries, artists in glasswork, upholsterers, decorators, sculptors, and others. Several of the special divisions have been provided with workshops in order to facilitate a thorough practical instruction in addition to the training in drawing and general artistic principles. The school is also entitled—under certain conditions—to grant diplomas entitling the holders to teach certain branches of art trades, and it also undertakes the training of future masters and mistresses of freehand and art-trade drawing. It is noteworthy that special attention is devoted to moderately-gifted pupils, and that pupils who do not possess a sufficient measure of the artistic faculty are not admitted to the school.

The aim of the artisans' school is to provide general and special instruction in drawing, practical instruction in modelling, finishing with special courses for apprentices, journeymen, and master workmen in the different branches of art trades. The

evening continuation school, which is attached to the artisans' school, aims at giving general instruction, and includes, besides the subjects already mentioned, such subjects as plane and solid geometry, natural science, mechanics, estimates, historical development of various trades, etc.

The evening drawing and modelling school is completely separate from the day (art-trade) school, and is intended for all those whose occupations do not permit of attendance at the day school, and for such pupils as only attend part of the day instruction; for those latter the evening drawing and modelling school is compulsory in order to prevent them from lagging behind and impeding the course of the instruction. It is also compulsory—for certain subjects—for all pupils of the preparatory school, and for all backward pupils of the art-trade school. The evening drawing and modelling school may be therefore generally regarded as an extra tuition course for the art-trade school.

The following remarks apply only to the art-trade school:—The pupils are divided into two principal classes—ordinary and extraordinary pupils. Pupils for the preparatory school must be at least 14 years old, and have completed the course of the elementary schools; pupils for the special branches of the art-trade school must be at least 15 years old and must produce proof of artistic talent and training. The sole difference at this art-trade school between ordinary and extraordinary pupils consists in the fact that the former attend during the whole week, the latter at least three days per week. The fees are payable in advance, and amount to only 1*l.* 16s. per half-year for pupils of the preparatory school and the eight special branches and the women and girls' department, and to 5s. for the evening modelling and drawing school; extraordinary pupils pay 4s. per half-year extra fee, and all pupils pay an entrance fee of 3s. Indigent pupils may be wholly or partially dispensed from the payment of fees. A small number of scholarships are also available, but the amounts are insignificant as compared with those available in the United Kingdom.

After giving elaborate details of the subjects of instruction, together with the number of hours per week devoted to the several lectures, exercises, and practical work, Dr. Rose remarks that, although the instruction in the art-trade school in its branches still corresponds, generally speaking, to the programme previously drawn up for the school, yet alterations in the method of teaching, material of instruction, etc., take place every year. Formerly, following the tendency of the times, the study of the antique and earlier styles stood in the forefront of the instruction, and everything tended towards the attainment of as complete a knowledge as possible of the various styles. During the last few years, however, the cultivation of the individual's own style or characteristics is now taking its natural dominating position. The object of the study of the ornamental forms of the old style is no longer to create an apparent correctness in style by exact imitation of foreign styles and combination of various correct motives of style; it is now generally accepted that a German cannot feel, think, and create, artistically, in the same manner as the Chinese and Indian, or a Russian like the Japanese, and that, therefore, the man of the XXth century cannot feel, create, and receive impressions like the man of the Gothic or Roman period. The study of the old styles, however, still gives, and always will give, an indication as to how art and art-work have developed in accordance with the different feelings of different times and peoples, and it will always be its province to indicate and teach what each one should strive to attain in his own particular period and circumstances. On the basis of this recognition, combined with the regular study of the surroundings, landscape, and comprehension of the local colouring, Nature studies of the characteristics of plants, animals, and men, the school endeavours to educate the students of the school in independent work by the cultivation of their own styles; the awarding of prizes for personal designs assists the endeavours in this direction. The observation of home art is cultivated by direct reference to the same, or by the pupils being set the task of themselves seeking out the most beautiful and picturesque subjects of their native district, and seconding it by drawings from Nature. A very special object which the school seeks to attain is faultless artistic representation, which is demanded in all draughtsmen's work, and is even extended to the preparation of large details for the sake of practice.

As appears from the long existence of the workshops, the endeavour of the school has always been to cultivate instruction in manual dexterity. The independent construction of models embodying their own designs is intended to safeguard the students against a one-sided purely draughtsman's instruction; it is intended at the same time to enable those art-trade designers, who in future will be occupied more with designing than with the practical making of art-trade objects, to test the practicability of their own designs and their effect when embodied. The work in the instruction workshops thus affords the students opportunities of ascertaining what special materials can be suggested or what effects may be obtained by various methods of treatment, and, generally speaking, all productive advantages which instruction in manual skill affords are, as far as possible, utilised. In the instruction workshops the possibility of a complete artistic and practical manual training is also afforded. The students in the architectural department of the school therefore make models or architectural forms in gypsum, cardboard, and sawwork; the furniture designers and art cabinet-makers work out their designs as sketch models in clay or plastilin, and share in the instruction in wood-carving, veneer-cutting, etching wood, and other instruction in carpentry. The art-trade designers and lithographers etch in copper and zinc, engrave ornaments in various materials, make copper printing plates from their own designs and sketches, print with the same in the copper printing press, and practice drawing on stone and algraphy; they model in clay and plastilin, or emboss, punch, and cut leather, and execute work by the etching process. The ceramic designs of the pupils are also executed in the actual workshops; the pupils turn their vases or vessels on the wheel, glaze and fire them, paint them with slip painting or with the casting horn, etc.

The attendances at the art-trade and artisans' school, which, in 1884, amounted to 1,234, had risen in 1903 to 1,846. For this number of pupils a teaching staff is provided consisting of seventy-two professors, masters, assistants, architects, engineers, painters, drawing masters, modellers, special technical masters, lithographers, and master workmen and representatives of the various branches of the art trades. The total expenditure for school buildings, as they stand at present, must amount to about 23,000*l.*; this sum does not include all the interior equipment for the workshops. The school is not self-supporting, this being evident from the low rate of fees charged—and is in the receipt of the annual support indicated by these figures:—State, 2,200*l.*; town, 1,000*l.*; district, 50*l.*; District Savings Bank, 60*l.*; Mainz Industrial Association (annual), 850*l.*; ditto (extraordinary), 315*l.*; miscellaneous, 15*l.*; total, 4,490*l.* The relations of the school to the art-trade industries of the town and neighbourhood are of the most intimate and cordial nature; it is, in fact, practically to the Mainz Trade Association (Gewerbeverein) that the school owes its foundation and maintenance. Pupils who leave the school, after having completed the full courses of their departments, readily find occupation in all the branches of the art trades. Constant inquiries are made at the school on the part of art-trade manufacturers desirous of acquiring fully-trained and skilled assistance. The school remains in this manner in close touch with the industries concerned, and is enabled to impress upon intending pupils the necessity of a period of practical work before joining the school.

After reviewing in detail the art-trade schools of Munich, Nuremburg, Leipzic, Dresden, Düsseldorf, Strassburg, Stuttgart, Aix, Altona, Barmen, Berlin, Charlottenburg, Breslau, Frankfort-on-the-Main, Cassel, Cologne, Erfurt, Hanover, Karlsruhe, Königsburg, Magdeburg, Pforzheim, and Weimar, Dr. Rose makes the following concluding observations:—

It is scarcely possible at present to utter a definite expression of opinion upon the relative merits and failings of the German art-trade schools, as many of them are of too recent origin, and others have only lately been reorganised. The movement in favour of art-trade instruction seems to be still in an experimental and tentative stage, and some time must yet elapse before anything like uniformity is attained in the methods of instruction or unanimity arrived at regarding the cardinal principles of art involved in art-trade instruction. Taken as a whole, with some exceptions, the art-trade schools have not attained the high-water mark of efficiency occupied by technical schools.

A weak point is the paucity of instruction workshops, and the insufficient equipment and accommodation of those already installed. This has been caused by the lack of the necessary funds and by the failure to grasp the important *rôle* played by such workshops in art-trade instruction. These defects, however, are being rapidly remedied, the best proof of this being the large sums voted for new buildings and extensions, and the considerable annual subsidies granted by governments and municipal authorities for purposes of maintenance.

The art-trade products of Germany show much that is desirable and praiseworthy beside much that is wholly undesirable. But it is beyond reasonable doubt that the production of the former has been influenced by the art-trade schools, and that the production of the latter is due partly to manufacture solely for the purposes of profit, and partly to the indifference of an undiscriminating public. However, good taste and superior manufacture, the fruits of the spread of art-trade instruction, are gradually but surely prevailing.

## *OBITUARY.*

COLONEL STANLEY BIRD.—We regret to announce the death, after a few days' illness, of Colonel Stanley George Bird, C.B., which occurred at his residence, Ashdown House, Hungershall Park, Tunbridge Wells, on the 18th inst., in his 68th year. He was one of the founders and hon. secretary of the Institute of Commanding Officers of Volunteers. In business Colonel Bird was connected with the building trade. He was the eldest son of the late Mr. George Bird, of the Hall, Pinner, and married, in 1862, Charlotte, daughter of Mr. T. S. Wall. He was also the originator of the Central Association of Master Builders of London (now the London Master Builders' Association). He was one of the prime movers in establishing the National Association of Builders, and the moving spirit in transforming the old Builders' Society, established in 1834, into the Institute of Builders (Incorporated), of which Institute he was President for the first three years of its incorporated existence. He had been chairman of the Builders' Accident Insurance Company since its foundation, in 1881, and had been twice Master of the Tylers' and Bricklayers' Company, being, at the time of his death, "father" of that guild. For many years he was Chairman of St. Mary's Hospital, Paddington, and a director of the Westminster Fire Office and of the Crystal Glass Insurance Company. The funeral took place at Rusthall Church at one o'clock on Saturday, April 22, and among those present, in addition to the members of the family, were General Sir Alfred Turner, K.C.B., Colonel Ococks, Mr. John Marsland, Mr. H. Mansfield, Mr. C. J. Maton, Mr. E. Woods, Mr. T. Ryan (St. Mary's Hospital), Mr. Stenton T. Covington (the Westminster Fire Office), and Mr. R. S. Henshaw (representing the directors of the Builders' Accident Insurance Company). At the same hour a memorial service was held in the Garrison Chapel, at Winchester, by the Victoria and St. George's Rifles, quartered there.

MR. J. H. BRIDGE.—We have to record the death of Mr. John Henry Bridge, builder, of Brewer-street, Maidstone, which occurred at his residence on the 11th inst. The deceased for ten years was secretary to the Maidstone Building Trades' Association, and for many years he also acted as hon. secretary to the Maidstone Natural History Society.

MR. R. GUELTON.—Canadian papers just to hand announce the death, at Toronto, of Mr. Richard Guelton, the inventor of the process of making Mycenian marble. Born in Belgium of French parents, he spent seventeen years in Britain and ten years in the United States, leaving many examples of his work in both countries. During the past three years he had made his home in Canada. The King Edward Hotel and the City Hall are the best examples in Toronto of the marble processes with which his name was connected.

AERIAL ROPEWAYS.—A plan for erecting aerial ropeways for the conveyance of coal from Venice to Mestre on the mainland has been presented to the Ministry for Public Works and Marine in Rome by the engineers, Carrissimo & Crotti, of Milan. It is to be on the German system, consisting of two ropeways, one for sending off loaded buckets, containing 500 kilos. each, and the other for receiving back the empty ones. It has been calculated that, when the plant is complete, about 10,000,000 tons of coal a year might be forwarded to Mestre, a part of which would have to be stored there. The cost of the plant would be about 160,000*l.*, and it is said that the ropeways might be in operation a year from the date of the beginning of the works. The electrical power would be supplied by the local stations. The project is now under consideration.

## *GENERAL BUILDING NEWS.*

CATHOLIC CHURCH, WILLINGTON.—This building at Willington, Durham, will, with the Presbytery and the site, cost about 4,500*l.* The architects are Messrs. Kelly & Dick, of London. In the form of a cross, the church, built of rock-faced stone from Teesdale, is 90 ft. long by 65 ft. broad. There are two transepts, and the dome, which covers the sanctuary, is about 36 ft. high from the inside. The windows have been supplied by Messrs. Atkinson, of Newcastle. A corridor leads from the sanctuary to the Presbytery. Mr. Hopper, of Wolsingham, has had the building contract.

PROPOSED ROMAN CATHOLIC CHURCH, ROTHESAY.—A new Roman Catholic church is to be erected at Rothesay by the Marquis of Bute. The building will have a tower and spire 140 ft. in height, with belfry and peal of nine bells. Accommodation will be provided for about 1,000 persons. The plans have been prepared by Mr. R. Weir Schultz, London. The building will be on the arched principle, the roofs being supported by octagonal and circular columns. The flooring is to be of concrete flagged with wood blocks and marble. The cost will be 28,000*l.*

METHODIST CHURCH, WOODHOUSE. — The foundation-stones were laid a short time ago of a new Methodist church which is to be erected in Woodhouse. The building is the design of Messrs. J. P. Earle, architects, of Sheffield, and, inclusive of furnishing, it is estimated to cost 1,200*l.* The style is Gothic, and stone will be used in its construction throughout. The interior will be furnished with open pitch-pine pews, capable of seating 260 persons, and a rostrum of the same material. The structure will be lighted with leaded lights, and the ventilation will be on the natural principle, with fresh-air inlets, siphon extractors on the roof, while the heating will be on the low-pressure hot-water system. In addition to the main building a minister's vestry will be erected in the rear of the church. The contractors for the buildings are Messrs. G. E. Bates, of Intake.

CHURCH, MURRAYFIELD.—At the sitting of the Edinburgh Dean of Guild Court on the 20th inst. warrant was granted for the erection of an Established Church at Ormidale-terrace, Murrayfield. The building will accommodate about 800 persons, but it is not proposed to proceed at present with the upper part of the tower, the chancel, or the north transept. The portion of the building to be proceeded with will seat about 600. Outside and inside the walls will be finished in rubble from Hailes quarry, with dressings from Prudham quarry, and the roof will be of open timber construction. The total cost of what is now to be built will be a little over 6,000*l.* The church is from designs by Mr. A. Hunter Crawford.

FREE CHURCH, ORDIQUHILL, N.B.—The United Free Church of Ordiquhill and Ord has just been reopened after renovation. The architects were Messrs. D. & J. R. M'Millan, Aberdeen. The contractors for the work are as follows:—Mason, William K. Gray, Kinaldie, Portsoy; carpenter, John Gordon & Sons, Fordyce; slater, J. G. Laird, Banff; plasterer, James Ingram, Cullen; plumber, J. & T. Campbell, Buckie; painter, Alexander Chalmers, Banff; leaded windows, Edward Copland, Aberdeen; seating, William Dawson, Aberdeen. The cost of the buildings will amount to a sum of about 1,000*l.*

CHURCH, WESTOE.—The new United Methodist Free Church, which has been erected at the corner of Birchington-avenue and Mortimer-road, Westoe, South Shields, was opened on the 21st inst. The new building comprises a church with accommodation for 450 persons, and Sunday schools and meeting-room capable of seating about 400 people. The church is entered from Oxford-street through a vestibule which occupies the whole of the frontage, and it gives access to an octagonal tower, a stone staircase leading to the gallery. Behind the rostrum there is a semi-octagonal apse, with seats arranged for the choir, and a recess for the organ. Vestries are provided at the other end of the building. The schools are placed in Birchington-avenue, and consist of one large school hall, meeting-room, and other accommodation on the ground floor, and there is a large schoolroom on the first floor. The architect was Mr. George R. Smith, of South Shields, and the contractors Messrs. W. J. Robertson & Son.

SANATORIUM, DELAMERE FOREST.—The Crossley Sanatorium for Consumptives in Delamere Forest has been handed over, fully furnished and ready for use, to the Manchester Hospital for Consumption. The terrace on which the hospital stands is 480 ft. above sea level, and to the south, the east, and the west there are fine views of the Cheshire plain. The near foreground is forest, and about 10 acres of lawn have been cleared and sown and planted with ornamental shrubs. The façade of the main building is 300 ft. in length. The sanatorium faces almost due south, and the windows of all the patients' rooms open down to the floor. In nearly every case the window is sufficiently wide to enable a bed to be placed lengthways in the open air or to be lifted into the balcony outside. To the south of the hospital are placed shelters for open-air treatment. Some are fixed and some revolve; each holds either two or four patients. There are twenty-four rooms, on the south side of the building, with single beds, one with two beds, ten wards with four beds, and four wards with six beds. Two large sitting-rooms, with doctor's rooms and office, are also in this part of the building. Behind these are corridors, while all lavatories and baths, together with the lifts, are on the north side. At the east and west ends are various storerooms and offices. The cellarage is extensive, and here are placed the douche baths and the X-ray plant. From the main building a covered corridor leads to the chapel and the dining-hall, beyond which are the kitchens, nurses' and servants' dining halls, storerooms, and pantries. The patients' dining hall is separated from the chapel by the main corridor. This hall is 60 ft. long by 40 ft. wide. The patients will dine at twelve tables, each to accommodate eight persons. A feature has been made of the fireplace, which stands in a large recess. The chapel will provide accommodation for 150 persons. It has an apsidal east end, panelled in wood. On the north and the two sides of the altar are "three-light" windows filled with lead lights simply treated. The space in the east-end wall is occupied by a wooden canopy enclosing a rich tapestry dossal. The walls and the woodwork are coloured in shades of red and green. Ample ventilation is provided, and the windows, except those in the apse, open down to the floor level. The nurses' home stands about 80 yds. from the main block, and provides accommodation for nurses and servants. The laundry, engine and boiler house, gas plant, bacteriological department, and mortuary, stables, and cottages stand on the north side of the main road which runs between the main building and the kitchen block and past the nurses' home. Two cottages have been built for attendants. In the laundry separate machinery has been provided for the clothes of patients and the staff, but everything will pass through a disinfector before entering the laundry at all. Adjoining the laundry stands the engine-house, which contains two different classes of plant for the electric lighting of the hospital, one steam-driven and the other driven by gas. It is thought that the one will be more economical in summer and the other in winter. Next is the boiler-house, with two steam boilers. All the heating of the hospital, as well as the hot-water supply for baths and the steam for cooking, is provided from these boilers. The steam is taken from the boilers to the calorifiers in the main block, and these warm the circulating water. Beyond all these stand the sewage works, about 500 yds. to the south-west. Here bacteriological treatment has been adopted, while 8 acres of sloping ground have been secured for the final land filtration process before the effluent can be admitted to the forest brooks. At the pump-house a well has been sunk to a depth of 504 ft. below sea level. The buildings are fitted throughout with fire hose, and everything has been done by means of outside fire escapes and apparatus to reduce danger from fire to a minimum. All floors, in corridors, wards, and hall, including the chapel, have been covered with linoleum. It was thought that it would be warmer and quieter than the ordinary tarrazzo, and much more comfortable than the usual waxed ward floor, besides being more easily cleaned. Each patient has the use of a combined chest of drawers, wardrobe, and dressing-table. The elevation of the main building is faced with red Ruabon bricks up to the first floor. The upper stories are rough-casted in white spar, with red brick quoins and strings. All the buildings are roofed with Ruabon tiles. The original estimate of the cost of the sanatorium was 70,000*l.*, but this sum, we understand, has been exceeded. The architect was Mr. W. Cecil Hardisty.—*Manchester Guardian.*

CREMATORIUM, SHEFFIELD.—The new crematorium, erected by the Sheffield Corporation at the City-road cemetery, was opened on the 5th inst. The work, which was carried out from designs prepared by Messrs. C. & C. M. Hadfield, architects, was illustrated in our issue for July 30, 1904.

BUSINESS PREMISES, LIVERPOOL.—The new offices of Messrs. Elder, Dempster, & Co., in Liverpool, are now nearing completion. The principal dimensions are as follows:—Water-street, 81 ft. 6 in.; Tower-gardens, 203 ft. 6 in.; Old Church-yard, 74 ft. 6 in. The area of ground covered is over 1,800 sq. yds. The class of stone used is principally Cefn. The base of the building is in polished red granite, two pillars of which material support the main entrance. The whole of the Tower-gardens elevation is faced with white porcelain enamel brick, as also are the sides of the well and of the central light and air space over the seven domes, which surmount the general office in the centre of the ground floor. There are seven floors in all, connected by two stone staircases. There are also three high-speed electric passenger elevators now being fitted. The floors are in mosaic and wood block, the whole of the basement, ground, mezzanine, and first floors are of fireproof construction. The main entrance and other parts of the building will be lined with marble. The stairway and corridor walls generally are tiled. The whole of the edifice is lighted electrically, and warmed by means of low-pressure hot water and fires. Three boilers, situated in the basement, supply the power for this. For the design of the work Messrs. Briggs & Wolstenholme, F. B. Hobbs, and Arnold Thornley, Liverpool, are responsible.

PROPOSED NEW TOWN HALL, WYCOMBE.—The Town Council of Wycombe, having applied to the Local Government Board for approval to the borrowing of a sum of 3,038*l.* to defray expenditure in excess of the amount already authorised to be borrowed in respect of the new town hall, Colonel W. R. Slacke, R.E., Local Government Board Inspector, attended at the Guildhall a short time ago to conduct an inquiry into the application. Amongst those present were Messrs. Rushbrooke (Borough Surveyor), Bateman (architect), Silk (quantity surveyor), and Fishburn (clerk of the works for the town hall). The Town Clerk stated that a loan of 10,800*l.* had already been granted for the town hall, being 9,500*l.*, the estimated cost of the building; 500*l.*, architects' fees; and 800*l.*, cost of land. Mr. Bateman, architect, gave evidence in relation to the building of the town hall, explaining that the tender of Messrs. C. H. Hunt & Son, of Wycombe, being the lowest, was accepted at 10,375*l.* The sum of 400*l.* was allowed for contingencies. Other details were explained by Mr. Bateman, who produced plans and documents for furnishing particulars to the Inspector.

PRIMITIVE METHODIST CHAPEL, MORPETH.—A new Primitive Methodist church, in Howard-terrace, Morpeth, was opened a few days ago. Taking advantage of a rapid slope in the site from the street level southward to the Cotting Burn, the architect, Mr. J. W. Taylor, Newcastle, has provided on the ground floor a hall, classrooms, parlours, and kitchen, and, above these, on the first floor, a church, with vestries, etc., which are approached by a flight of steps from the streets. The building is Perpendicular in style, and the structure has been executed by Mr. T. A. Turnbull, Rowlands Gill.

MEMORIAL SCHOOLS, LEWISHAM.—The foundation-stone of the schools to be erected in Hither Green-lane, Lewisham, to the memory of the Rev. Walford Green, D.D., was laid recently. The site adjoins the Wesleyan Church, to which the schools, when completed, will form an addition. The hall, which will measure 54 ft. by 45 ft., will have provision for twenty classrooms, and an infants' room is to be 30 ft. by 24 ft. There will also be a room for the secretary, a library, and other accommodation. Messrs. Spalding & Spalding were the architects for the work.

SCHOOLS, GRESFORD.—The buildings used as a girls' and infants' school at Gresford having been recently condemned by the Board of Education and the local education authority, the managers have decided to erect schools upon a new site in accordance with plans drawn up by Mr. Morison, architect, of Wrexham. The tender of Mr. A. K. Simmons, of Gwersyllt, amounting to 2,027*l.*, has been accepted for the carrying out of the work.

MARKET EXTENSION, BRADFORD.—The market extension in Rawson-square was opened on the 18th inst. The exterior of the new building, which is from designs by Messrs. T. C. Hope & Son, is built of stone, and is Italian Renaissance in style. It consists of a market hall, surrounded by ten shops, with frontages to Rawson-square, Northgate, and James-street, and a hotel. Domed towers, 84 ft. in height, mark the extremities of the Northgate elevation, and a third dome, hexagonal, and 60 ft. high, rises above the main entrance. The area of the market hall, covering which is a single-span roof of glass and iron, is 6,684 sq. ft., and the floor area of the shops and the hotel is 51,400 sq. ft. An entrance is provided to each frontage, with a waggon entrance from James-street, and a covered way communicating with the present meat and fish market. The cost of the extension, including 25,000*l.* for the site, is over 50,000*l.* Mr. Abner Rhodes was clerk of the works. The principal contractors have been Messrs. T. Obank & Sons, masons; E. Fearnley & Sons, joiners; A. Ross, plumber; Crabtree

& Berry, plasterers; W. H. & E. Walton, slaters; S. Parsons & Co., Ltd., ironwork; W. Blythe, hotel ornamental glass; Hellewell & Co., of Brighouse, market hall glass roof; Arthur Wear, painter; Collinson Brothers, and the Reliance Company, Ltd., for electric lifts; Sutcliffe Brothers, gates, lamps, and hotel balustrade; and Cordingley, mosaic flooring.

BRANCH LIBRARY, HULL.—The Hull Carnegie Branch Library, which is nearing completion, is situated in the West Park, adjoining the main entrance on the Anlaby-road. Briefly, it is a one-story building, set upon a mound. The interior is divided into two apartments. One of them is the lending library, and this is separated by an ornamental glass screen from the reading-room, which is panelled in oak, with open roof, and giving accommodation at the carved oaken benches for fifty-two readers. All the flooring is of pitch-pine blocks, and the artificial lighting is by electricity. This reading-room opens out upon a verandah, where the readers may take their books or magazines out into the open air. The architect is Mr. Hirst, the City Architect.

PROPOSED GOLF PAVILION, BULWELL.—The plans, prepared by Mr. F. B. Lewis, City Architect, Nottingham, for the new golf pavilion, which is to be erected in Bulwell Forest, have been approved by the Nottingham Public Parks Committee. The new building is to be of brickwork, with tiled roofs. A club-room, 33 ft. 6 in. by 18 ft. 6 in., is provided on the ground floor, together with a tearoom, 18 ft. by 15 ft., an apartment for hats and coats, two dressing-rooms, with accommodation for 472 lockers, bath, and lavatory, and a drying-closet. Accommodation for the caretaker, who will live on the premises, is also embodied in the scheme, and a basement is to be constructed which will be utilised as a store cellar. A small verandah, supported by iron columns, will be erected at the front of the pavilion, and the whole building will be heated by hot water and lighted by gas. The cost is estimated at 3,000*l.*

TRAMWAY OFFICES, SUNDERLAND.—New tramway offices and headquarters at Sunderland have just been erected at the Wheat Sheaf, Monkwearmouth. The front of the building is of Pelaw facing bricks, with dressings of Dunhouse stone. The building has been designed and carried out, at a cost of about 6,000*l.*, by Mr. F. E. Coates, the contractor being Mr. S. Warburton, Manchester.

POORHOUSE, DALZIEL.—Lord Hamilton of Dalziel formally opened the Dalziel new poor-house recently. The building, which has been erected at a cost of 17,000*l.*, is from the plans of Mr. Alexander Cullen, Motherwell.

BUILDING IN YORK.—A report of the Building Inspector to be submitted to the York Corporation at their next meeting shows that, during the past year, 240 dwelling-houses were approved and completed, 122 were approved and in course of erection, and 247 were approved and not commenced, a total of 609. The rentals of the completed houses vary from 10*l.* to 200*l.*, the majority (fifty-eight) being 15*l.* houses. There were forty-eight with a rental of 14*l.*, twenty-five of 12*l.*, twenty of 17*l.*, nineteen of 13*l.*, eleven of 50*l.*, and ten of 10*l.*

CHURCH, HUDDERSFIELD.—From plans prepared by Messrs. W. J. Morley & Son, architects, Bradford, a new Wesleyan church is to be erected at Crosland Moor, Huddersfield, at a cost, including the site, of about 4,500*l.*

THEATRE, COLCHESTER.—The new Grand Theatre at Colchester has just been opened. The building has been erected from designs prepared by Mr. J. W. Start, of Colchester.

MUNICIPAL OFFICES, CARLISLE.—The new Carlisle municipal offices in Fisher-street are now nearing completion. The work is being carried out from plans by, and under the supervision of, the City Surveyor, the contractors being Messrs. Gilbert Hill & Son. The sum borrowed to meet the cost of the purchase of the property was 6,500*l.*, and of the alterations 1,000*l.*

## *STAINED GLASS AND DECORATION.*

NEW WINDOWS, KILKENNY CATHEDRAL.—Two large lights, nearly 20 ft. high, in the south transept of Kilkenny Cathedral, have just been filled with Munich stained glass by Mayer & Co. They illustrate the texts, "I will give thee a crown of life," and "Her children arise up and call her blessed," and have been erected in memory of the late Dowager Marchioness of Ormonde.

VESTRY SCREEN, BERE REGIS.—A new oak vestry screen has been placed in the Church of St. John the Baptist, Bere Regis. It has been executed by Messrs. Harry Hems & Sons, of Exeter.

RESTORATION OF ROOD SCREEN, COMBE-IN-TEIGNHEAD CHURCH, NEAR NEWTON ABBOT.—The old rood screen in this church has just been restored according to the scheme of Mr. Robert Medley Fulford. The work has been carried out by Messrs. Harry Hems & Sons, Exeter.

ST. NICHOLAS CHURCH, EAST DEREHAM.—The Countess of Leicester unveiled, a few days ago, two large windows, one, the east, to the memory of Queen Victoria, and the other a memorial to the poet Cowper, who lies buried there, this being the 105th anniversary of his death. The window contains a full-length portrait of the poet, and illustrations from his works. Both windows were designed and executed by Messrs. Heaton, Butler, & Bayne.

ALL SAINTS', HASTINGS.—The lower portion of the east-end of this church has been decorated with paintings and polychromy by Messrs. Percy Bacon & Brothers, of London and Edinburgh. They have introduced figures of Bishops and other Saints of local interest, with adoring Angels over the altar.

ST. JOHN'S CHURCH, HERNE BAY.—A two-light window was inaugurated on Easter morning by the vicar of the church. Each light contains the figure of a saint in a canopied niche, "St. Peter" and "St. James." Between the two lights is a brass, with heraldic bearings. The window and brass were executed by Messrs. Percy Bacon & Brothers.

## *APPOINTMENTS.*

LEEDS.—At a meeting of the Sewerage Committee of the Leeds City Council, on the 19th inst., Mr. George Adam Hart, Chief Assistant Engineer to the Birmingham, Tame, and Rea Drainage Board, was recommended to the Council for the post of Sewerage Engineer to the Corporation, at a salary of 1,000*l.* a year. Of the original sixty-nine applicants the number was first reduced to thirty-one, then to twelve, who were interviewed by the committee, and, in the end, a selection of three was made, from whom the final choice was taken. These three gentlemen, whose claims were considered at the meeting of the committee, were Mr. George Adam Hart; Mr. Joseph Garfield, Sewerage Engineer to the Bradford Corporation; and Mr. Alfred Fidler, Borough Engineer at Northampton.

## *SANITARY AND ENGINEERING NEWS.*

THE IMPROVEMENT OF THE HUMBER.—At the request of the Humber Conservancy Commissioners, Mr. G. N. Abernethy, C.E., and Mr. W. H. Wheeler, C.E., have prepared a report upon the condition of the river Humber and the means that should be taken to improve it. After dealing geographically with the waterway, and referring to the works of dock construction, which have already formed a line of river wall four miles in extent, the report states that there has been very little variation in the deep-water channels of the lower part of the river during the last seventy-six years. The engineers point out that the shoal in the navigable channel near the White Booth-road has been gradually increasing in height and in length, and they estimate that about 3,000 ft. require dredging in order to bring the shoal into conformity with the other part of the deep-water channel up to Hull. About 1,123,880 cubic yds. of material would have to be removed, at a cost of 56,194*l.* They point out that it would be of advantage to dredge the north side of the channel (so as to bring the deeper water close to the entrance of the Alexandra Dock) to a depth sufficient to give 14 ft. at low water. In order to do so 1,750,000 cubic yds. of material would have to be removed, at a cost of 87,500*l.* They further consider that a deep-water channel should be maintained on the north side of the river for some distance above Hull, at a cost of between 25,000*l.* and 30,000*l.* Mention is also made of the construction of a training wall towards Paull from the easternmost part of the wall of the proposed joint dock, and the cost of this is estimated at 59,717*l.*—*Yorkshire Post.*

SEWAGE WORKS, DUMFRIES.—The drainage and sewage purification works, undertaken by the Town Councils of Dumfries and Maxwelltown, following upon an inquiry regarding the pollution of the river Nith, held in May, 1902, have been completed. The towns being divided by the river, it was considered impracticable to carry out a joint purification scheme, and independent schemes on the same lines were furnished by Mr. W. Allan Carter, C.E., Edinburgh. That for Dumfries has been completed at a total cost of about 40,000*l.*, and is now in operation. The Maxwelltown works will not be in operation for several weeks yet. Their cost approximates to 26,000*l.* The system of purification adopted is the bacterial. The river is subject to tidal action, which renders the filter-beds inoperative for two periods each day owing to their low level. During these periods the effluent from the septic tank is diverted by an automatic arrangement of air-dome and valves into a contact bed containing a thick layer of gravel, and is there stored until the tide recedes. The septic tank measures 190 ft. by 76 ft., and is 18 ft. in depth, and has a capacity of a million and a half gallons. It is formed of concrete, the roof being supported on brick piers carrying steel girders. The Maxwelltown works are situated almost directly opposite, on the lands of Troqueer Holm, of which 2 acres were purchased for the purpose. The septic tank here measures 150 ft. by 40 ft., and is 8 ft. deep.

LOUGH NEAGH DRAINAGE SCHEME.—It is announced that Sir Alexander Binnie has been appointed by the Irish Office, on the nomination of the Lord Lieutenant, to make further inquiry into, and to report upon, the proposed drainage of Lough Neagh and the River Bann.

BRIDGE, HOWFORD.—The new Howford bridge over the River Nairn was opened recently. Mr. Cram, County Surveyor, was engineer of the work, and Mr. M'Kenzie was contractor. The new bridge is a steel-girder structure of two spans of 56 ft. each, the roadway being 20 ft. wide, and having a level of 7 ft. above that of the old bridge. It replaces the old wooden bridge, which was erected in 1858, and has been built by the County Council at a cost of 2,800*l.*

THE ROYAL SANITARY INSTITUTE.—At an examination in Sanitary Science as applied to Buildings and Public Works, held in Liverpool, April 14 and 15, one candidate presented himself, to whom a certificate was granted:—Mr. E. M. Longsdon (Bakewell).

BRIDGE, KINCLAVEN, N.B.—The new bridge over the Tay at Kinclaven was opened on the 22nd inst. The structure is built of red sandstone from Keithick Quarry. It has six arches, each 61 ft. span, and five piers 6 ft. wide. The abutment on the Meikleour side measures 34 ft., and that on the Kinclaven side measures 32 ft., a total length of 462 ft. The roadway is 16 ft. wide. The foundation pilings, which pierce a bed of solid gravel to a depth of 14 ft., are of American rock elm. The piers are square, with cutwaters, and shaped. The arch rings are cemented blocks made on the spot. The parapet is of blocked ashlar, and is 3 ft. 8 in. high. The whole fabric is filled with concrete to within a foot of the roadway. The gradient over two arches on either side is 1 in 30, and 1 in 60 towards the middle of the bridge. The top of the parapet, at the highest point, is nearly 30 ft. above ordinary water level. The total cost of the undertaking, including the new roadway on the Kinclaven side, but excluding the greater part of the new roadway on the Blairgowrie side, is 7,300. The bridge has been built by Messrs. James Young & Sons, Ltd., Glasgow, from plans prepared by Mr. J. E. Harrison, M.Inst.C.E., of Messrs. Formans & M'Call, Glasgow. The work has been carried out under the supervision of Messrs. Young's representative, Mr. James Rust.

## *FOREIGN.*

FRANCE.—M. Carolus-Duran having been elected director of the French School at Rome, it will shortly be necessary to elect a successor to him as President of the New Salon. The names of MM. Rodin, Besnard, Carrière, and Roll are mentioned as among probable candidates.——In accordance with the provisions of a legacy left by M. Maurice Delarne, the Société Centrale des Architectes has founded a biennial prize, which will be awarded this year for the first time, for an approved piece of civil or religious architecture by an architect who is a Frenchman and not a holder of the Prix de Rome. The prize founded by the late M. Rouyer, the architect, for an illustration of a monument of French architecture, will also be awarded this year.——The Municipal Council of Paris has under consideration for the formation of a "Palais des Sports et d'Agriculture," either by a re-erection of the Galerie des Machines or in a new building. The proposed site is between the fortifications, the Route de la Revolte, and the Portes d'Asnière and Courcelles.——It is proposed to erect to the left of the Avenue de Bois de Boulogne, in the centre of a planted lawn, a basrelief by M. Moncel representing Alfred de Musset in the midst of an allegorical group symbolising his principal works.——Several members of the Paris Council have brought forward a proposal for founding a new room at the Petit Palais to contain the casts after death (*masques mortuaires*) of the features of celebrated men, such as Pascal, Beethoven, Newton, Goethe, Napoléon, Victor Hugo, Lamartine, Gambetta, etc.——The excavations being carried on in the Place de la Bastille have brought to light the footing walls of the ancient fortress, which will be utilised to a

great extent as the foundations of a metropolitan railway station at that point. An inscription will be placed indicating the origin of this historic wall.——The jury in the competition opened by the municipality of Chalon-sur-Saone for the erection of a monument commemorating the defence of the city in the war of 1870, have selected for execution the design of M. Moreau-Vauthier, sculptor, and M. André Bérard, architect. The monument consists of a group formed by a mounted soldier carrying a wounded man, whom he delivers up to a figure personifying the town of Chalons.——The Municipal Council of Nice has opened a competition for a new group of schools.——The jury in the competition opened by the Municipality of Vaudœuvre for a Hotel de Ville and schools have awarded the first premium to M. Bentz, of Nancy.——A committee has been formed to erect, at Annecy, a monument to the novelist Eugene Süe.——The death is announced, at the age of 61, of M. Frédéric Cavel, architect to the city of Paris, and Chevalier of the Legion of Honour. As will be remembered, it was M. Cavel who was architect for the recent additions to the Bourse.

GERMANY.—The Royal Theatre at Berlin, which was condemned as unsafe in case of fire, has been rebuilt under the direction of Herr Genzmer, and was reopened on March 21.——The Town Hall at Stuttgart, designed by Professor Heinrich Jassoy, is completed.——A new wing has been added to the Law Courts at Munich from designs by Professor Friedrich von Tiersch.

SWITZERLAND.—The new church at Rothenbach has been built from designs by Herr K. Indermühle, and was consecrated on April 9; the building is intended to accommodate 400 persons, and was erected at a cost of 60,000 francs.——The new school at Freiburg is to be built from designs by Herr Erwin Heman, under the direction of Herr Hertling, and will include ten classrooms, a music-room, and a dwelling-house for the headmaster.

## *MISCELLANEOUS.*

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. E. A. Victor, architect, has removed his offices from 14, Sackville-street to 161, New Bond-street, W.

WOOD FROM COLUMBIA.—The forests of Columbia, according to an official report which has reached the British Foreign office, contain considerable quantities of mahogany, cedar, etc., of good quality, and desultory attempts at exportation have been made, but with little success, owing chiefly to the high rates of ocean transport. A sawmill, situated in the forest thirty miles from Santa Marta, and four miles from the railway line, supplies the local demand for lumber (chiefly mahogany), and sends its surplus to Barranquilla, where the consumption is large.

THE INCORPORATED CHURCH-BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 20th inst., at 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz:—Building a new church at Newcastle-under-Lyme, St. Paul, Staffs, 175*l.*, and towards enlarging or otherwise improving the accommodation in the churches at Cil-y-cwm, St. Michael, near Llandovery, Carm, 25*l.*; Peatling Magna, All Saints, near Lutterworth, 25*l.*; and Richmond, St. John the Divine, Surrey, 55*l.*, in lieu of a former grant of 40*l.* Grants were also made from the Special Mission Buildings Fund towards building mission churches at Hackett, St. Paul, near Thornbury, Glos., 20*l.*; Jameston, near Manorbier, Pembs., 10*l.*; and Wilsill, near Pateley Bridge, Yorks, 30*l.* The following grants were also paid for works completed:—Cwmllynfell, St. Margaret, near Swansea, 100*l.*; Grimsby, All Saints, 125*l.*; Eastbourne, St. Philip, 125*l.*, on account of a grant of 200*l.*; Reading, St. Bartholomew, 125*l.*; Hopwood, St. John the Evangelist, near Manchester, 75*l.*; Meshaw, St. John the Baptist, Devon, 5*l.*; Crookes, St. Thomas, near Sheffield, 20*l.*; South Shields, St. Oswin, 10*l.*; Colchester, St. Stephen, 40*l.*; and Abertillery, St. John, Mon., 25*l.* In addition to this the sum of 760*l.* was paid towards the repairs of thirty-three churches from trust funds held by the Society. The Society likewise accepted the trust of a sum of money as a repair fund for Christ Church, Spitafields. The Annual General Court of this Society will be held on Thursday, May 4, at the Church House, Dean's-yard, Westminster, at 3 p.m., when the chair will be taken by the Lord Bishop of St. Albans.

TECHNICAL INSTITUTE AT STOURBRIDGE.—An art and industrial exhibition in a new Technical Institute at Stourbridge was opened on the 24th inst. by Lady Cobham. The buildings include accommodation for a free library, and the total outlay, exclusive of site, has been about 10,000*l.*

OLD WINCHESTER RELIC IN DANGER.—An interesting relic of Winchester is in danger of being demolished—an old Tudor timber tenement in Cheesehill-street, which has come into the market in consequence of the death of the owner. The house is one of the very few left of the Tudor time. Over the door is a statement that it was long the Rectory house of the ancient Soke parish of St. Peter's Cheesehill. It was formerly owned by the Fleming family, one of whom was Recorder of Winchester and became Lord Chief Justice. The house has had a most interesting history, and steps are being taken to try and get it preserved.—*Daily Graphic.*

LIVERPOOL SCHOOL OF ARCHITECTURE.—The ordinary meeting of the Liverpool Education Committee was held on the 19th inst. at the Municipal offices, Mr. J. W. Alsop, deputy-chairman, presiding. The Technical Education Sub-Committee recommended that the City Council be asked to establish a municipal school of art, and that the School of Art of the Liverpool Institute be used for the purpose. The recommendation was approved. It was also recommended by the Committee that the Education Committee take over the assets and liabilities of the School of Architecture and Applied Arts as from May 21 next.—Mr. B. W. Ellis opposed the latter recommendation. He said that the school had been unsuccessfully and extravagantly managed. At present there was a debt of about 500*l.*, and by the end of the season this would be about 700*l.* The students only numbered 135, and the annual cost was 2,000*l.* As compared with this, the School of Art, in Mount-street, with 357 pupils, only cost 200*l.* more. The history of the school did not justify the committee in taking over the liabilities.—Alderman Willink pointed out that, if the liabilities were not taken over, they would have to be borne by the individual members of the committee of management. The work of the school was separate and quite different from the work of the School of Art, and it was more costly of necessity. On May 21 the liabilities would be 307*l.*, and this would be balanced by the value of the other assets—models, furniture, casts, and so on.—Answering Alderman Williams, Alderman Willink said a scheme had already been adopted by the committee to work the School of Art and the School of Architecture and Applied Art as one institution. The recommendation was adopted with two dissentients.

A HINT TO ARCHITECTS.—Plans for twenty houses in Londonderry-road, one house in Cambridge-street, three in Bishopton-road, and eleven in Dixon-street, were approved at the meeting of the Stockton Urban Council on the 19th inst. Alderman Hind, Chairman of the Plans Committee, said they had regulations that plans should be marked with the points of the compass, and that the size of the rooms, and the yard areas, and other particulars should be shown. Recently, many architects had been very lax in this matter, and, at the meeting that morning, owing to the absence of this information in several cases, instructions were given that the architects were to be informed that the plans would be rejected unless the particulars were supplied. These had since been given, but he hoped the architects would not cause the committee any further trouble in the matter.—*Darlington Star.*

THE INTERNATIONAL FIRE SERVICE COUNCIL.—The International Fire Service Council, which was founded in 1900, and represents the interests of the world's various fire brigade and fire-preventive societies, with a total membership of over 3,000,000, had its annual executive meeting at Brussels on April 17 and 18. Colonel Sextus Meyer, late Danish Royal Engineers, was in the chair, supported by the vice-presidents, Chief Officer Westphalen, late District Surveyor of Hamburg, and Mr. Edwin O. Sachs, of the British Fire-Prevention Committee, London. Matters relating to fire prevention and building construction had considerable attention, to such an extent, in fact, that a special standing committee of the Council has been appointed to deal with the subject, comprising:—Chief Officer Dittman (Bremen), Mr. Ellis Marsland, District Surveyor (London), Building Councillor Modersohn (Unna), Mr. Sachs (London), and Professor Woolson, Columbia University (New York). The Council are issuing a technical dictionary (French, English, German) of terms relating to fire-resisting construction and fire brigade work which should be of service to the professions concerned. The Council's inquiry office at Luxemburg is now open, and technical questions can be addressed there through any of the three British Societies represented on the Council. Arrangements have been made to avoid clashing of congress subjects, and the congress publications of all countries will, in future, be on uniform lines.

## *CAPITAL AND LABOUR.*

BUILDING TRADE, SUNDERLAND.—In connexion with the dispute in the building trade, a meeting was held on the 20th inst. in Sunderland of the men interested, and, as a result of the deliberations, which were conducted in private, it is understood that the men are not likely to submit to the terms of the masters, and unless they are considerably modified the men will come out on strike.

BUILDING TRADE DISPUTE, NEWCASTLE AND DISTRICT.—A mass meeting of members of the Newcastle district of the Operative Bricklayers' Society was held, on the 20th inst., in the Co-operative Hall, Darn Crook, Newcastle. The object of the meeting was to hear the result of the conference between the masters and the delegates of the men, and to consider the proposals made. What the masters require in the case of the bricklayers seems to be pretty much what they propose to the plasterers, masons, and joiners. There is, to begin with, the demand for a reduction of wages one penny per hour. As in the case of the other grades, this proposal, while it is a vital one to the men—as will be judged when it is stated that it means a reduction of 4s. 2d. per week on a fifty hours' shift—is not the only one of importance, in that there are certain modifications of rules desired. One of the most important—if not the principal—of these is that which relates to the employment of apprentices. Now it is the custom for the bricklayers to have from one to four apprentices and no more on any job. This rule the masters want to erase, and to stipulate that there shall be no limit to the number of apprentices. Then, as to working hours, the masters' proposal is something similar to that offered to the plasterers, whereby, in winter, they want the short time to last for four months instead of twelve weeks as at present. They desire the men to begin at eight o'clock, and work right through, without the breakfast half-hour. The overtime proposals of the masters are also similar to those suggested to other grades, and where time and a quarter is now paid for the first two hours, and after that time and a half, the masters desire that time and a quarter shall be paid for the first four hours, and afterwards time and a half shall come into force for shift work. The proposal of arbitration in case of disputes is also offered to the bricklayers. As a result of the discussion, the men have rejected all the masters' suggestions, and the gravity of the situation is thus seen, for the notices of the men are due to expire on May 1. The men in Newcastle are to test the feeling of the men affected in other parts of the district, and for this purpose a meeting of delegates from Sunderland, North Shields, Jarrow, Blyth, and Newcastle is to be held. The members of the Newcastle district of the Operative Society of Plasterers have received the reply of the masters to their counter proposals. Its nature is unfavourable.—*Newcastle Chronicle.*

NOTTINGHAM BUILDING TRADE DISPUTE.—As the result of a conference between representatives of the various societies affected, and delegates from the Master Builders' Association, one point may practically be said to have been eliminated from the dispute in the Nottingham building trade. This was the demand by the employers for uniform working hours. An arrangement has been come to agreeing to this request, and, although it has to be sanctioned by the general body of masters and men, it is not considered probable that any objection will be raised. By the new arrangement there would not be such diverse times of starting work in the winter, and another suggestion is that work should cease at five o'clock. With regard to conferences on the other points, no steps have, as yet, been taken by either side.

EDINBURGH JOINERS' STRIKE.—Another meeting of the operative joiners, at present on strike in Edinburgh, was held on the 21st inst. in St. Cuthbert's Hall, King's Stables-road. Mr. John Lawson presided over a large attendance, and it was reported that another master had signed the by-laws. There is no sign of yielding on the part of the men, who are standing firmly together.—*Scotsman.*

GLASGOW JOINERS TO STRIKE.—A mass meeting of the joiners of Glasgow and district was held in the Wellington Palace, Glasgow, on the 21st inst., to receive the replies of the masters to the by-laws sent out by the men's organisation. These by-laws lay down working conditions similar to those which have prevailed during the past twelve months, while the Master Wrights' Association, on the contrary, desire to reduce the men's wages by a penny per hour. There are between 3,000 and 4,000 members of the two joiners' trade unions in the district. It was unanimously agreed not to entertain the suggestion of arbitration. It was further agreed, in view of the fact that the Master Wrights' Association only

represented a small proportion of the employers, to treat with the masters individually. Up till the close of the meeting seventy signed copies of the by-laws had been received from masters agreeing to the men's terms. These represent over 1,000 men. It is stated, on behalf of the men, that a much larger number of acceptances would have been received but for the prospect of arbitration which the Lord Provost's action seemed to hold out.

ABERDEEN JOINERS.—The masters have sent to the men's society a communication embodying their ultimatum in the dispute existing between them and the operatives on the question of the by-laws. The masters propose to amend rule No. 4 so as to read as follows:—"Each employer agrees to pay three-fourths of his workmen 8d. per hour, and one-fourth not less than 7d. per hour." It is further stipulated that the other by-laws remain as at present for another year. The employers add that, considering the depressed state of trade, they think they have made a very fair and reasonable offer to settle the dispute.

## Legal.

### DISPUTE AS TO A PARTY-WALL.

THE hearing of the case of Forbes *v.* Wallis & Co. concluded before Mr. Justice Phillimore, sitting without a jury in the King's Bench Division, on the 19th inst.—an action by Miss Forbes, the freeholder of a house and premises known as Dunottar, Bedford Park, against the defendants, a firm of builders, and the freeholders of the adjoining property, Sydney House, for an injunction to restrain the defendants, their servants and agents, from interfering with the party-wall dividing the two properties, and for an order requiring the restoration of the party-wall which the defendants had pulled down. The plaintiff also claimed damages.

Mr. McCall, K.C., and Mr. Stewart appeared for the plaintiff, and Mr. Montague Shearman, K.C., and Mr. Singdon for the defendants.

Mr. McCall, in opening the plaintiff's case, said that his client complained of a very high-handed trespass. In 1886 both the properties in question belonged to a Mr. Berry. He conveyed Dunottar to a Mr. Orpen, retaining Sydney House himself. In 1901 the plaintiff purchased from Mr. Orpen the freehold of Dunottar. He (counsel) submitted that at that time the wall in dispute either was the property of the plaintiff because it had not been expressly reserved, or it was a party-wall between the two owners. In 1903 Messrs. Wagstaff & Co. wrote to the plaintiff, on behalf of Mr. Berry, saying that the wall was the property of the plaintiff. In April, 1904, Mr. Berry conveyed the freehold of Sydney House to the defendants. In May, 1904, the plaintiff, having heard that alterations were contemplated on the Sydney House estate interfering with her property, wrote to the defendant. To this letter she received no answer. On June 2 Mr. Peter Dollar, plaintiff's architect, wrote to the defendants with regard to light and air questions, or as to any proposed buildings. Upon that nothing was done. On February 10, 1905, Mr. Wallis wrote plaintiff saying he was calling upon her with regard to the wall in question. When he called plaintiff told him she could not consent to anything with regard to the wall without consulting her solicitor and architect. On February 10 a plan was sent to the plaintiff, and her consent was asked to the wall being pulled down. On the following Monday, without any further notice, defendants directed their men to go into the plaintiff's garden to push down this wall into the defendants' property. Defendants did not merely push down the wall, but destroyed the trees growing close to the wall.

Mr. Shearman, interposing, said he did not think there would be any question about the measurements. The defendants claimed this wall and the footings. He admitted that they trespassed on the plaintiff's land to push the wall down, but they had paid a sum into court which he thought would cover any damage.

Mr. McCall, continuing, said that, after the defendants had pushed down the old wall, they proceeded to build a new one, but on different lines from the old one. His case was that the new wall was on the footings of the old one, and that the footings of the new wall extended on to the plaintiff's land several inches beyond the old footings.

After evidence as to the plaintiff's title had been given, Mr. F. Baxendale, an Associate of the Surveyors' Institution, examined, said he was assistant to Mr. Peter Dollar. The witness gave evidence as to the encroachment of the footings of the new wall on to plaintiff's land, and as to the damage done to the plaintiff's trees, shrubs, and plants by the defendants' men in pushing down the wall.

Mr. Maurice Adams gave evidence also as to how far the footings of the old wall extended.

At the close of the plaintiff's case, Mr. Shearman, for the defendants, submitted that the amount paid into court covered all the damage done by the trespass. With regard to the party-wall he contended that it was never meant to convey it to the plaintiff. In the event of its being held to be a party-wall, he contended that the defendants had the right to build up to the footings of the old wall, and that the wall was common to both parties.

Mr. Thos. Rogers Wagstaffe, F.S.I., and Mr. Geo. Waine, a surveyor, gave evidence on behalf of the defendants to the effect that the whole of the new wall of the defendants', including the footings, was within the defendants' boundary.

Mr. R. T. Hayes, Building Inspector to the Acton Urban District Council, also gave evidence on behalf of the defendants.

Mr. E. H. Wallis, the defendant, a builder and contractor, gave evidence, and denied that there was any substantial trespass on the plaintiff's land. He claimed the wall as his, and maintained that he had only rebuilt the wall on the site of the old wall.

At the close of the evidence, and after some argument, it was agreed that the defendant should be allowed to erect the wall of his buildings on his own land, and 4½ in. off the site of the present wall, the land so left to be the plaintiff's land.

His lordship said that the only question remaining was that of damages.

After hearing Mr. McCall and Mr. Shearman on this question, his lordship, in giving judgment, said that as to the trespass the plaintiff had made out a good cause of complaint. He came to the conclusion that the wall was a party-wall, and that the defendants had no business to pull it down as they did or for the purposes for which they pulled it down. He agreed that defendants were tenants in common of the wall, but they had acted wrongfully in pulling it down. His lordship then referred to the agreement come to between the parties as to the building of the wall as set back, and said that, formally, he would grant an injunction restraining the defendants from keeping the wall up as it now stood. On the claim as to trespass his lordship awarded the plaintiff 70*l.* damages and the costs of the action.

Upon the application of the plaintiff's counsel his lordship reduced the damages to 60*l.*, the defendants allowing the plaintiff to put trellis work on the wall up to 7 ft. and to train creepers thereon.

### A DANGEROUS BUILDING.

AT Marylebone the owner of the structure, known as St. Benet and All Saints' Church, Lupton-street, Kentish Town, was summoned by Mr. John Collman, on behalf of the London County Council, for failing to comply with a notice to take down the south aisle and support and secure the nave, or to underpin and support the walls of the aisle, and reconstruct or otherwise support the flying arches over it, and also to take down or reconstruct, or otherwise support the chancel arch, the building being, in the opinion of the district surveyor, in a dangerous state. Mr. Redwood Davies, barrister, defended. Mr. Collman stated that, in consequence of the report of the district surveyor that the structure was in a dangerous condition, a notice was served upon the owner on February 3 requiring him to carry out the work which the surveyor had certified as requiring to be done. The surveyor reported on February 27 that the building had been shored, but nothing else had been done; and, as matters were still in the same state on April 4, the Council wrote to the owner's surveyor, the architect of the church, asking that the work should be carried out. A reply was returned to the effect that the delay was due to the difficulty of collecting the necessary money. Mr. Paul Taylor asked if it was a case in which the owner required further time. Mr. Davies replied that they were doing the work, but not quite as the Council wished. Mr. Collman said that all they wanted was that the work should be done. He was surprised that the case should be contested. He suggested an adjournment for three months, on the understanding that the work was put in hand and proceeded with as soon as possible. Mr. Davies remarked that they wished to have some guarantee that the Council would leave them alone; one of the orders of the Council was absolutely impossible for any surveyor. Mr. Paul Taylor adjourned the summons for three months to enable the surveyors on either side to come to terms, observing that the Council were very reasonable as a rule, and he did not think that they would require anything to be done that was impossible.—*Times.*

## PATENTS OF THE WEEK

APPLICATIONS PUBLISHED.*

6,978 of 1904.—A. F. PETCH: *Machines for Testing the Strength of Materials.*

Machines for testing the strength of materials, consisting in the combination of two levers and shackles so arranged that the machine can be used as a single-lever testing machine for light loads, or as a combined lever testing machine for heavy loads, hydraulic straining cylinders being used and mounted on trunnions, so that the cylinders can be swung into a convenient position for examination or removal of the hydraulic leathers or other packings employed.

7,141 of 1904.—H. HOFMEISTER: *System of Ventilation.*

A system of ventilating without creating draughts, by means of pivoted windows with a leaf inwardly inclinable, characterised in that above the pivoted leaf is arranged an air-chamber communicating with the outer air when the pivoted window is opened, and isolated from the interior of the room by a sifter or other similar device, and the lower air inlet whereof is regulated, when opening and closing the leaf, by a flap device furnished with a deflecting plate for the air and connected to the leaf of the window, which is guided between lateral brackets furnished at their inner edges with beadings in order to obtain an absolutely tight closing, preventing direct entry of outer air and obliging it to always pass through the air-chamber for entry in the room.

7,465 of 1904.—A. ROBERTS and M. SYER: *Water-closet Seats and Means for Fixing the same.*

Water-closet seats, consisting of a board or flap to each side of which is fitted a T-iron or metal clamp pivoted at its rear end to a board or support fixed at right angles to a vertical board, secured to the wall of the room or place in which the water-closet is to be used, and projecting at the back to form hinges, the flap or seat being formed of one or more pieces.

7,757 of 1904.—E. LEACH and I. H. BRIERLEY: *Apparatus for Heating Water for Baths and other purposes.*

An apparatus, whereby water at any desired temperature between cold and boiling point may be supplied to baths and for other purpose by the movement of one lever or handle, said apparatus consisting of a water valve and a steam valve in alignment, a rod extending from each of said valves and loosely connected centrally, a lever or handle fitted on the rod extending from the cold-water valve and operating by a partial movement said cold-water valve, and also the steam-water valve by the completion of the movement of said lever or handle, a mixing chamber which may have a perforated lining containing glass or other marbles, inlet apertures in said mixing chamber for the admission through the said valves of cold water and steam, an outlet therefrom for the passage of the hot water to a bath or elsewhere, and means for regulating the supply of cold water to the mixing chamber.

8,329 of 1904.—J. M. NICHOLLS: *Cowls or Ventilators Specially Applicable to Smoky Chimneys.*

This invention relates to cowls or ventilators specially applicable to smoky chimneys, and has for its object to prevent down draughts in chimneys, ventilating shafts, and the like, and consists in fixing over the top of the chimney or shaft an openwork cone or cylinder with longitudinal openings or flutes. In carrying out this invention the openwork cone or cylinder may be made in metal or earthenware, and its base is fixed on the top of the chimney or shaft, the base of the cone or cylinder fitting within or outside the top of the shaft. The cone or cylinder is either made solid or built up, and the cone may be truncated at the top so that a sweeping brush can be passed up the chimney or shaft and completely through the cone. The cone or cylinder may be double, the openwork part of the outer wall being opposite the solid part of the inner wall.

8,943 of 1904.—M. J. ADAMS: *Lavatory Basins.*

This invention consists in the combination of a lavatory with a trough, the lavatory being held up above the trough, and partly resting thereon, the waste of the lavatory discharges directly into the trough, and the overflow of the basin also discharges directly into the trough.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made

9,627 of 1904.—F. SMITH: *Fastenings for Doors and the like.*

This invention relates to locks and bolts where doors and the like are required to be secured from the outside, but will open automatically from the inside when there is a pressure brought against the door. When securing doors it is usual to employ a top and bottom bolt worked by a double-action lever or other contrivance, but it has been found that it is possible to raise the bottom bolt from the outside of the door by inserting an instrument underneath the top. To prevent this a spring catch is employed to engage with the bottom bolt, and so prevent the bolt being raised, but at the same time it allows the action of the falling cross-bar to release the bolts. An indicator is employed to show that the bolt is properly shot and the catch or action in proper working order.

10,205 of 1904.—J. MCVEAN: *Drain Scoops and the like.*

This invention relates to scoops for use in removing the sand and other solid sediment from drains, traps, and such-like places, and has for its objects to simplify the process and adapt the tool for use alternately; first as a spade and then as a scoop. In carrying out one modification of the invention a scoop bowl or blade of any suitable size and shape for the purpose named is made and hinged to the extreme end of a tube or tubular shaft. A heel piece projects from the bowl, and a rod or tube is fitted telescopically within the bore of the first-named shaft, and connected by links or suitable devices to the said bowl. If the centre or inner shaft is pushed towards the bowl the latter is made, by means of the said link or links, to turn on its hinge and project sideways from the shafts somewhat like a hoe or the letter L. If the inner shaft is drawn back again the bowl, actuated by the link or links, is moved on its hinge into its first position in line with the shaft. When in the spade form the scoop can be inserted in a drain and forced edgeways into the sewage sediment. If the outer or hollow shaft is then held firmly, and the inner shaft pushed forward, the bowl of the scoop acts as a lever and cuts out a portion of the solid matter from the rest. The two handles are then locked together, and the scoop can be withdrawn together with the sediment.

10,414 of 1904.—C. SHOWELL: *Manufacture of Sliding Bolts.*

This invention relates to the manufacture of sliding bolts, in which the barrel part and the base plate are made from one solid piece of metal in which the said barrel part is complete in its circular formation. In carrying out this invention a peculiar sectionally-shaped strip, consisting somewhat of a W-shape, is provided by rolling, extruding, or drawing, in which the central parts are formed somewhat of a circular instead of angular shape, with their two lower points so shaped that, in subsequent operation, they may be brought together and form a close butt-joint. The outer sides ultimately form the base plate. Such a strip is then passed through successive drawing, rolling, or the like operations until the central part before-named is formed into a barrel, with its lower two parts firmly butting against each other in a solid manner, at which stage the two outer parts now lie in line with each other, and thus forms the flat base plate.

11,497 of 1904.—F. SMITH: *Casement and Fanlight Openers.*

The object of this invention is to construct a casement or fanlight opener so that only the pulley wheel and plate and end of the screw-pin shall project within the room, so as to facilitate the hanging of the curtains or other window dressings. The opener is constructed so that it can be applied to a casement or fanlight working on hinges either at the top, the bottom, or the sides, and it is also applicable to fanlights or casements working on pivots. A hollow shaft or spindle is formed, which is inserted through the frame or sash and secured to the outside of the frame or sash by means of a crank-lever working on a pivot or in any suitable way. Inside this hollow shaft or spindle a screw-thread is formed, or an ordinary screw-nut may be used, attached to the lever and inserted in the hollow shaft or spindle, or in the screw-nut a screw-pin, at the front of which a pulley-block or wheel, or any other attachment is placed that may be applied to work it on the sash or frame—that is, on the inside of the room. By this means the pulley-block and plate and the end of the screw-pin only project within the room. By working the pulley-wheel and the like the hollow shaft is caused to travel forwards and backwards on the screw-pin, and thus open or close the fanlight or casement.

11,686 of 1904.—F. WHITLEY: *The Jointing of Seats for Pedestal Closets and the like.*

A method of jointing together sections or pieces of wood to form seats or covers for pedestal closets and the like, comprising dovetailed or similar-shaped grooves cut or formed in the opposing edges of the sections, and a longitudinal jointing strip or piece having its upper and under surfaces inclined or wedge-shaped, or diverging from a middle position to the outer edges to give a greater thickness at the said edges than in the middle, the grooves in adjacent sections, when brought together, forming an opening corresponding in shape to the shape of the strip in cross-section, and receiving the said strip edge, when driven home into the grooves, firmly secures the sections to each other.

13,417 of 1904.—J. GALLOWAY: *Apparatus Employed in Connexion with Flushing Cisterns.*

This invention relates to apparatus employed in connexion with flushing cisterns for water-closets, urinals, and other purposes, and has for its object that of making the working and flushing operations absolutely noiseless. This is carried into effect by providing the syphon pipe of the cistern with an air inlet which may be controlled by means of a valve operated by means of a ball-float, float, or valve and lever, the air inlet of which is regulated by the movement or fall of water in the cistern.

28,058 of 1904.—H. RECKNAGEL: *Spraying Devices for Lavatory Basins.*

This invention relates to spraying devices for lavatory basins. The apparatus, hitherto known for the purpose of washing the face by means of a continuously-flowing vertical ascending jet or jets of water, has the disadvantage that the used water mingles with the clean water. Apparatus in which this disadvantage is obviated by the use of a rose attached to a flexible tube have the disadvantage that one of the user's hands is required for holding the rose. According to this invention, two upwardly-directed, converging currents of water in the form of jets or sprays are used in such a manner that they co-mingle to a greater or less extent and thus form a kind of "ridge" of water into which the user can plunge his face while retaining the free use of both hands, so that the face can be completely washed with the aid of the latter, without altering the adjustment of the nozzles, roses, or sprays by which the water is emitted.

18,618 of 1904.—T. A. WOOLLDRIDHE and E. A. WARD: *A Tool or Appliance for Cleaning, Scraping, or Removing Obstructions from Drains and other Pipes and Tubes.*

A tool or appliance for use in cleaning, scraping, or removing obstructions from drains and other pipes and passages, consisting of a body part made from closely-coiled spring wire and a flexible leading end, pilot, or nose-piece, which is either formed integral or in one piece with the body coil, or is separate and attached thereto.

9,694 of 1904.—J. STODDART T. STODDART: *Construction of Fountains.*

This invention relates to means for making a fountain work automatically by springs or weights. The fountain works by a piston with a hollow rod, the piston acting as a valve. The hollow rod is pierced where it is fixed on top of the piston, to allow the water to pass up the rod. The piston is enclosed in a cylinder with holes at the bottom of cylinder, to receive water, and a hole at the top to allow the rod to pass up through. The piston is lifted up by a spring and pressed down by hand, or levers. When the piston is pressed down the cylinder fills with water. The spring lifts the piston up and the piston forces the water up the hollow rod, and out of a nozzle at the top of the rod.

11,140 of 1904.—A. B. GEEN: *Railway Bridges and like Structures.*

This invention relates to railway bridges and structures for carrying overhead travelling cranes supporting rails for wheeled carriages and the like, and has for its objects to effect a saving of time and labour in erection, and to realise economy and an increase of strength. According to the present practice, in the construction of short-span railway bridges, a rolled steel joist is arranged under each line of rails, the rails being carried upon transverse sleepers secured to the joists by hook-bolts, and the rails being secured to the sleepers by dog-spikes or the like. In this invention, however, the rail and joist are rolled in one piece. The joist is erected as part of the structure of the bridge in the usual way, the head and the web of the rail being integral with the joist and presented uppermost. When the joists have been fitted, the rail track is already laid, the joists being erected in such position that the rail-forming portions are in line with and form a continuation of the rails leading up to the bridge. No sleepers, hook-bolts, washers, or dog-spikes are required.

27,737 of 1903.—F. M. MCLARTY: *Means or Apparatus for Use in Cutting or Dressing Stone, Metal, or like Materials.*

A cutter made of a thin cutting disc, or thin cutting discs, which is, or are maintained rigid by being confined between spacing or distance pieces, said pieces having in their peripheral grooves or spaces and the said discs being mounted so as to be rotatable, or carried upon a support capable of rotating, means provided by which lubricant can be applied to the parts moving in contact with each other.

9,680 of 1904.—H. H. LAKE (Jencquel-Hayn): *Manufacture of Building Materials, Heat-insulating Materials, and the like.*

A process of manufacturing building and insulating materials which consists in burning mixtures formed of kieselguhr, clay, and vegetable filling materials, and in which there is used as binding means silicated magnesia obtained by precipitation from magnesium salt solution, and hydrated silicia acid added separately to, or produced in, the mixture.

11,056 of 1904.—A. B. LUNDBERG and G. C. LUNDBERG: *Ceiling or Wall Rosettes for Electric Lighting and Heating.*

Ceiling or wall rosettes for electric lighting and heating, consisting in the combination and arrangement of three contact plates, each with a terminal for leading wires, and others for attachment of flexible wires, also contact tubes or the like for producing the various adaptations, and comprising a method of tapping current from or feeding current to a rosette, by means of a detachable connexion, which may be of any suitable type, two-pin, concentric, single-pin, or the like.

11,539 of 1904.—B. G. WILMER and A. W. BOND: *Open Grate or Fireplace.*

This invention relates to an open grate or fireplace. In carrying this invention into effect the grate or firegrate has a grate bottom, preferably located in a sinking or recess in a hearth formed of cement or tiles, with a back and two sides formed of slabs of fireclay closely fitting and cemented together. Above the three slabs above-mentioned, and closely fitting thereon, is a block of fireclay, the back portion of which inclines forward at the upper end, where it is shaped to receive a metal flue to convey the products of combustion into the chimney; the sides also are shaped so as to meet the forwardly-inclined back. The upper part of this block of fireclay is also so shaped (preferably semi-circular) to act, in conjunction with the metal flue, as a support for the rear ends of the headers of a brick arch supported on piers, one on each side of the stove or fireplace. The metal flue is preferably made of cast-iron in the form of an oval (or circular) tube in cross-section, the front portion thereof resting in the block of fireclay being in a horizontal position, and the rear portion thereof curving upwards preferably in a segment of a circle. This rear portion is preferably of round section, upon which rests another curved tube or swan-neck of suitable material forming a trap and effectually preventing down draught.

4,965 of 1904.—G. A. PHILLIPS and W. H. BAGLEY: *Furniture Castors.*

A furniture castor, consisting in the combination of a socket fixed in or adapted to fit in a tubular leg, said socket having a flange or washer at the bottom forming a bearing for the axis of the hornpiece, and also having a top bearing for said axis and a combined hornpiece and hollow axis formed of a sheet metal blank, and adapted to fit and turn in said socket, said hollow axis having a side tongue adapted to engage over the flange or washer of the socket to secure the combined hollow axis and hornpiece therein, said tongue projecting below the socket and adapted to be pushed inwardly to release the combined hollow axis and hornpiece from the socket.

12,062 of 1904.—R. SHARP: *Window Sashes.*

A window sash having divided styles, the inner halves of the styles being pivoted to the outer halves, and one-half of the style having a longitudinal recess, in which is situated a bar or strip adapted to be forced into engagement with a comparatively shallow longitudinal recess in the other half of the style by any convenient means when the two halves of the style coincide.

12,296 of 1904.—J. T. M. BURGESS: *Window-sash Wedge and Lifter.*

This invention consists of a plate at whose forward end the sides are shaped and then turned up so as to form a wedge upon each side. At the other end of the plate the metal is turned

up or otherwise shaped so as to form a thumb and finger piece. In the plate is also formed a longitudinal slot or hole through which a wood screw may be passed, and by which it may be secured to the sash in such a manner that the said plate may be moved along said screw when the said plate is drawn back and turned at right angles to the sash frame, the wedge portion may be thrust between the sash and the frame so as to prevent all shaking, and when again withdrawn and turned into the vertical position, the sash may be raised or lowered by means of its turned-up end.

12,482 of 1904.—T. TILL: *Flushing Cisterns.*

The object of this invention is to provide a simple and effective means of starting the siphon of water-closet, and other flushing cisterns. This invention relates more particularly to a flushing cistern whose principal parts may, if desired, be formed of earthenware; it is filled by means of a ball-cock provided with an overflow in the usual way. In the open end of the uptake of the siphon is arranged the nozzle or open end of a pipe communicating with the bottom or lower end of an open-top cylinder in which works a piston or the like operated by means of a pull and rod with return spring, or by weighted lever, or other device. Upon pulling down the chain or the like the piston is forced down the cylinder and water is ejected through the nozzle or open-ended pipe up the uptake of the siphon, which, along with the water it disturbs and takes up with it, is sufficient to start the siphon and empty the cistern. The spring returns the piston to its normal position ready for another discharge.

12,692 of 1904.—J. E. RUSSELL: *Domestic Fireplaces.*

This invention relates to domestic fireplaces, and is directed to what is known as the "fret," which is a structure attached to the front of the stove at about the fire level to support a plate, a cup, or any article to be kept warm. According to this invention the fret is so attached that it can be adjusted horizontally away from the fire and back again as may be required, or turned from a horizontal into a vertical position so as to constitute a front to an open-fronted grate if desired.

12,717 of 1904.—J. W. RADFORD and J. G. GREAVES: *Adjustable Joints Applicable to Cylindrical Rails, Tubes, Cornice Poles, and the like.*

This invention relates to joints for cylindrical rails, tubes, cornice poles, and the like where it is required that they may be adjusted to any angle or continued around bends or corners. The joints are constructed at any angle across the diameter or section of the rail or tube, and are so formed and secured that they may be turned on their own axis. The inclined or bevelled joints on being turned "on their surface or plane" gives the required bend or angle.

9,706 of 1904.—J. T. SOUTH: *Bricks.*

A building brick which may be made in any required shape or size, composed of cement, chalk, the product of clay and chalk burned together, permanganate of potash, blue black, oxide of iron, and dissolved flint (being ordinary chalk flint reduced to a liquid state by steam applied at a pressure of 500 lb. to the square inch) mixed in proportionate parts with or without the addition of colouring matter—crushed to powder and reduced to a plastic state by the addition of water. The mixture is put into moulds or dies and left to dry, becoming ready for use in the course of a few days without burning or baking.

11,445 of 1904.—THE BRITISH THOMSON & HOUSTON COMPANY, LTD. (General Electric Company): *Hoisting System.*

A hoisting system for raising goods, consisting in the combination of an electric hoisting motor, a generator supplying current to the motor, having a series field-winding and a shunt-winding supplied with current from an auxiliary source, means for varying the current in said shunt-winding, and a prime mover of smaller capacity than the generator and motor for driving the generator.

25,441 of 1904.—R. BELL: *Ventilation of Houses, Hotels, Hospitals, and other Buildings.*

The invention consists of a frame of wood, iron, or other suitable material enveloped with cotton wool or other porous material, this covering being of sufficient thickness that, while permitting air to pass freely, will intercept fog and other atmospheric impurities, and thus act as a filter to the air in its passage through it. To retain the filtering material in position, it is fixed on the frame by encasing it in wire netting. This apparatus, which combines both a screen and filter, is applied as accurately as possible to the aperture through which the purified air is to be admitted to the building. This may be a window entirely or partially open, a door, or an opening made for the purpose. If it is desirable to warm the air before it finds its way into the interior of the building, there may be placed near the inner surface of the screen or filter a heating arrangement, consisting of hot water or steam pipes, or an electric heater, so that the air passing over these will be increased in temperature.

3,554 of 1905.—F. RENDER: *Detonator Fuses for Electric Blasting.*

This invention relates to detonators and fuses for blasting with either high or low tension current. In the construction of such detonators it is customary to employ a detonator charge with a copper ring or disc or cap with a central hole between the detonatory charge of fulminate and the fuse head containing the firing composition for electrically igniting the charge. It frequently occurs that the firing composition in the fuse head explodes without exploding the charge of the detonator owing to the flash not penetrating the hole in the copper disc. This invention is designed to prevent such miss-fire, and consists essentially in forming a compound electric detonator fuse with a charge of gun-cotton powder or other easily ignitable material between the fire charge in the fuse head and the annular disc which protects the detonator charge, which will carry the flame with certainty to and through the hole in the disc.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

April 7.—By JAMES HARRIS & SON (at Kingsley).

| | |
|---|---|
| Binsted, Hants.—"Hoggatts Farm," 14 a. 2 r. 29 p., f. | £490 |
| Freehold holding, area 3 a. 3 r. 25 p. | 105 |
| Freehold meadow, 4 a. 1 r. 24 p. | 110 |
| Two freehold cottages and 0 a. 2 r. 7 p. | 360 |
| Kingsley, Hants.—A freehold holding, 3 a. 3 r. 38 p. | 160 |

April 12.—By CHAPMAN & MARTIN (at Hailsham).

| | |
|---|---|
| Warbleton, Sussex.—"Red Pale," "Buck-steep," and "Guy's" farms, 45 a. 1 r. 9 p., f., p. | 1,250 |

April 13.—By W. H. BROWN (at York).

| | |
|---|---|
| Luttons Ambo, Yorks.—"West Lutton Farm," 262 a. 0 r. 34 p., f.. y.r. 236*l.* | 4,000 |
| "Manor House Farm," 361 a. 3 r. 0 p, f., y.r. 200*l.* | 4,675 |
| "East Lutton Farm," 291 a. 1 r. 23 p., f., y.r. 150*l.* | 3,700 |
| Pickering, Yorks.—A freehold farm, 203 a. 2 r. 21 p. | 3,150 |
| An enclosure of pasture, 4 a. 1 r. 10 p., f. | 123 |
| Thornton Dale, Yorks.—Two closes of pasture, 13 a. 1 r. 37 p., f. | 438 |

By NICHOLAS, DENYER, & CO. (at Reading).

| | |
|---|---|
| Caversham, Oxon.—The Caversham Flour Mills, area 7 acres, f. | 6,000 |

April 14.—By W. H. BROWN (at Scarborough).

| | |
|---|---|
| Scarborough, Yorks.—14A, 14B, 15, and 16, St Nicholas-st. (s.), f., y.r. 430*l.* (in one lot) | 10,400 |
| Bell Corner. two closes of land, 12 a. 0 r. 34 p., f., y.r. 46*l.* | 920 |
| Scalby, Yorks.—"Scalby Nabs Farm," 74 a. 1 r. 10 p., f., y.r. 35*l.* | 1,650 |
| Throxenby, Yorks.—"Newby Farm," 47 a. 0 r. 33 p., f., y.r. 90*l.* | 3,565 |

April 17.—By PERCIVAL HODSON.

| | |
|---|---|
| Southgate.—Avenue-rd., "Everard Cottage," and ½ an acre, f., p. | 335 |
| Charlton, Kent.—North-st., i.g.r. 20*l.* 7s., u.t. 55½ yrs., g.r. 10*l.* | 150 |
| Finsbury Park.—38, Upper Tollington-pk., u.t. 70 yrs., g.r. 7*l.*, e.r. 45*l.* | 435 |

By HY. HOLMES & CO.

| | |
|---|---|
| Pentonville.—Penton-st., "Belvidere Works," u.t. 41 yrs., g.r., etc., 90*l.* 1s., y.r. 250*l.* | 1,675 |

By REYNOLDS & EASON.

| | |
|---|---|
| Old Kent-road.—33, 35, and 37, King Arthur-st., u.t. 56 yrs., g.r. 11*l.* 5s., w.r. 81*l.* 18s. | 510 |
| 26, 32, and 38, King Arthur-st., u.t. 36 yrs., g.r. 9*l.* 9s., w.r. 79*l.* 6s. | 370 |
| 13, Glengall-rd., u.t. 16½ yrs., g.r. 4*l.* 4s., y.r. 38*l.* | 150 |

By WEATHERALL & GREEN.

| | |
|---|---|
| South Kensington.—51, Evelyn-gdns., u.t. 68 yrs., g.r., etc., 5*l.*. p. | 2,240 |
| Camberwell.—81 and 83, Denmark-rd., f., w.r. 78*l.* | 945 |

By W. WHITELEY.

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|---|---|
| Paddington.—16, Westbourne Ter.-rd., u.t. 37½ yrs., g.r. 10*l.*, e.r. 90*l.* | 600 |

April 18.—By DEBENHAM, TEWSON, & CO.

| | |
|---|---|
| Waldron, Sussex.—Freehold cottage and four enclosures, 5 a. 2 r. 21 p., p. | 450 |
| "Theobald's Farm," 37 a. 1 r. 35 p., f., y.r. 40*l.* | 1,000 |
| Heathfield. Sussex.—"Runtington Cottage," and 15 a. 1 r. 11 p., f., y.r. 27*l.* | 1,280 |
| "Runtington Farm," 39 a. 3 r. 6 p., f., y.r. 67*l.* 11s. | 1,525 |
| "Funnell's Farm," 20 a. 0 r. 31 p., f., y.r. 28*l.* | 700 |
| West-st.-la., two freehold cottages and 0 a. 1 r. 12 p. | 110 |
| "Chapel Cottage" and 4 acres, f., y.r. 20*l.* | 370 |
| "Stuckle's Farm," 11 a. 3 r. 26 p., f., y.r. 26*l.* | 600 |
| "Maynard's Green," a plot of building land, 1 acre, f. | 110 |
| "Little Funnels Farm," 4 a. 3 r. 33 p., f., y.r. 17*l.* 10s. | 310 |
| West-st.-la., a freehold holding, 10 a. 3 r. 0 p., y.r. 24*l.* | £560 |
| West-st.-la., two freehold and copyhold cottages, y.r. 15*l.* 16s. | 275 |
| Waldron, Sussex.—"Nightingale Farm," 18 a. 2 r. 26 p., f. and c., y.r. 20*l.* | 480 |
| "Mepham's Farm," 44 a. 3 r. 25 p., f. and c., y.r. 70*l.* | 1,950 |
| "Ashleigh Farm," 21 a. 0 r. 2 p., f., y.r. 60*l.* | 1,175 |
| Henlow, Beds.—Main-rd., a freehold building site, 9 a. 2 r. 12 p. | 640 |

By HAMPTON & SONS.

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|---|---|
| Wimbledon.—6, Lake-rd., f., y.r. 115*l.* | 1,400 |

By J. C. PLATT.

| | |
|---|---|
| Stoke Newington.—23, Brodia-rd., u.t. 59½ yrs., g.r. 6*l.*, e.r. 44*l.* | 280 |
| 56, Dumont-rd., u.t. 69½ yrs., g.r. 6*l.* 6s., y.r. 50*l.* 4s. | 295 |

By ROGERS BROS.

| | |
|---|---|
| Dulwich.—1, 12, 30, and 34, Shawbury-rd., u.t. 63 yrs., g.r. 17*l.* 16s., w.r. 146*l.* | 1,100 |
| 48 to 66 (even), Ulverscroft-rd., u.t. 73 yrs., g.r. 42*l.* 12s., w.r. 312*l.* | 780 |
| 1, 3, and 5, Cornflower-ter., f., w.r. 78*l.* | 790 |
| Peckham.—38, Forest Hill-rd. (s.), f., y.r. 40*l.* | 650 |
| 59, Talfourd-rd., u.t. 56 yrs., g.r. 7*l.* 10s., e.r. 40*l.* | 350 |
| 12, Denman-rd., u.t. 42½ yrs., g.r. 6*l.* 6s., e.r. 30*l.* | 290 |
| 14 to 21, Heaton-rd., u.t. 52 yrs., g.r. 40*l.* 5s., w.r. 318*l.* | 1,570 |
| 4 to 14, 32 to 46 (even), Marmont-rd., u.t. 50½ yrs., g.r. 70*l.*, w.r. 546*l.* | 3,710 |
| Old Kent-road.—57 and 59, Camilla-rd., u.t. 31 yrs., g.r. 9*l.*, w.r. 72*l.* 16s. | 440 |
| New Cross.—Lubbock-st., i.g.r. 50*l.*, u.t. 61 yrs., g.r. 30*l.* | 350 |
| Peckham.—Heaton-rd., i.g.r. 47*l.*, u.t. 51 yrs., g.r. 7*l.* | 630 |
| Bermondsey.—Cranham-rd., i.g.r. 24*l.*, u.t. 50 yrs., g.r. 1*l.* | 405 |

By WALTON & LEE.

| | |
|---|---|
| Finchley.—Fortis Green, "Beechwood," and 1 a. 2 r. 12 p., f., p. | 2,850 |

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

| | |
|---|---|
| Hammersmith.—King-st., "The White Hart" p.h., u.t. 52 yrs., y.r. 300*l.*, with goodwill | 16,600 |
| 1, Young's-corner (off-licensed premises), u.t. 15 yrs., y.r. 60*l.* with goodwill | 850 |

April 19.—H. DONALDSON & SONS.

| | |
|---|---|
| Dalston.—27, Downs Park-rd., u.t. 60 yrs., g.r. 6*l.* 10s., e.r. 45*l.* | 450 |
| 51, Middleton-rd., u.t. 16 yrs., g.r. 5*l.*, e.r. 40*l.* | 200 |
| 91, Lavender-gr., u.t. 44½ yrs., g.r. 5*l.*, y.r. 36*l.* | 355 |

By MAY & PHILPOT.

| | |
|---|---|
| Streatham.—38, Gleneagle-rd., u.t. 76½ yrs., g.r. 16*l.* 16s., e.r. 65*l.* | 630 |
| 21, Montrell-rd., u.t. 75 yrs., g.r. 10*l.*, e.r. 55*l.* | 550 |

By MORGAN, BAINES, & CLARK.

| | |
|---|---|
| Wallington, Surrey.—Heathdene-rd., "Dunedin," f., p. | 1,370 |

By ERNEST OWERS.

| | |
|---|---|
| Dalston.—112, 114, and 116, Lansdown-rd., u.t. 42½ yrs., g.r. 19*l.* 10s., w.r. 139*l.* 4s. | 800 |
| 38 to 44 (even), Albert-rd., u.t. 42 yrs., g.r. 21*l.* 15s., y.r. 152*l.* | 1,290 |
| Bromley-by-Bow. — Holden-rd., etc., i.g.r. 46*l.* 4s., u.t. 57 yrs., g.r. nil | 790 |
| Holloway.—Kingsdown-rd., i.g.r. 22*l.* 10s., u.t. 245 yrs., g.r. 9*l.* 9s. | 220 |

By PYKE, PYKE, & HOWLAND.

| | |
|---|---|
| Camden Town.—37 and 39, Crowndale-rd., u.t. 39 yrs., g.r. 14*l.*, y.r. 110*l.* | 1,000 |
| Notting Hill.—255, Lancaster-rd. (s.), u.t. 61 yrs., g.r. 7*l.*, w.r. 54*l.* 12s. | 260 |

By VARLEY & LOCKING.

| | |
|---|---|
| Stoke Newington.—Manor-rd., "Sunnyside," u.t. 60 yrs., g.r. 4*l.* 10s., e r. 100*l.* | 1,250 |
| 20, Osterley-rd., u.t. 59 yrs., g.r. 4*l.* 16s., e.r. 38*l.* | 400 |
| 6, Paget-rd., u.t. 76½ yrs., g.r. 7*l.*, e.r. 50*l.* | 560 |

By MORETON RICHES.

| | |
|---|---|
| Battersea.—49 and 51, Wilson-st., f., w.r. 46*l.* 16s. | 575 |
| Wandsworth.—44, Salcott-rd., u.t. 69 yrs., g.r. 6*l.* 6s., e.r. 38*l.* | 345 |

April 20.—By WORSFOLD & HAYWARD.

| | |
|---|---|
| Ealing.—76, Drayton-gdns., u.t. 92 yrs., g.r. 6*l.*, y.r. 34*l.* | 340 |

*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h for beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

## MEETINGS.

SATURDAY, APRIL 29.

*Architectural Association Camera and Cycling Club.*—Joint Visit with the A.A. Day School Club to Eltham Palace. Meet at the Palace 2.45 p.m.

MONDAY, MAY 1.

*Royal Institute of British Architects (Annual General Meeting).*—(1) Annual Report of Council. (2) Regulations for Architectural Competitions. 8 p.m.

*Society of Arts (Cantor Lectures).*—Mr. Alan S. Cole, C.B., on "Some Aspects of Ancient and Modern Embroidery." I. 8 p.m.

*Society of Engineers.*—Mr. E. R. Matthews on "The Parade Extension Works at Bridlington." 7.30 p.m.

TUESDAY, MAY 2.

*Society of Arts (Applied Art Section).*—Mr. J. Starkie Gardner, F.S.A., on "The Monumental Treatment of Bronze." 4.30 p.m.

WEDNESDAY, MAY 3.

*Society of Arts.*—Mrs. Burton-Brown on "Recent Excavations in Rome." 8 p.m.

*Royal Archæological Institute of Great Britain and Ireland.*—Viscount Dillon, Hon. M.A. Oxon., F.S.A., on "The Rack." 4 p.m.

*Builders' Foremen and Clerks of Works' Institution.*—Ordinary Meeting of the Members. 8 p.m.

*Institute of Sanitary Engineers, Ltd.*—(1) Election Committee, 3.30 p.m.; (2) Organising Committee, 5 p.m.

THURSDAY, MAY 4.

*Royal Institution.*—Professor Sir J. Dewar on "Flame." I. 5 p.m.

*Institute of Sanitary Engineers, Ltd.*—Visit to Messrs. Walker, Parker, & Co.'s Lead Mills, Belvedere-road, Lambeth. 4 p.m.

*Institution of Electrical Engineers.*—Extraordinary General Meeting—Discussion on Mr. A. M. Taylor's paper, "Standby Charges and Motor Load Development." 8 p.m.

FRIDAY, MAY 5.

*Junior Institution of Engineers (Westminster Palace Hotel).*—(1) Mr. L. C. Lambert on "The Influence of Depth of Water on Speed of Vessels," 7 p.m.; (2) Mr. James N. Boot on "Condensing Plant," 8 p.m.

SATURDAY, MAY 6.

*Edinburgh Architectural Association.*—Visit to Niddrie House.

*Institute of Sanitary Engineers, Ltd.*—Visit to Whitstable.

*Northern Architectural Association.*—Visit to Armstrong College, Newcastle-on-Tyne.

## TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

## PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

### BRICKS, &c.

| | £ s. d. | |
|---|---|---|
| Hard Stocks | 1 10 0 | per 1000 alongside, in river. |
| Bough Stocks and Grizzles | 1 6 6 | " " " |
| Facing Stocks | 2 2 0 | " " " |
| Shippers | 2 2 0 | " " " |
| Flettons | 1 7 0 | " at railway depôt. |
| Red Wire Cuts | 1 14 0 | " " " |
| Best Fareham Red | 3 12 0 | " " " |
| Best Red Pressed Ruabon Facing | 5 0 0 | " " " |
| Best Blue Pressed Staffordshire | 4 2 6 | " " " |
| Do. Bullnose | 4 7 6 | " " " |
| Best Stourbridge Fire Bricks | 4 0 0 | " " " |
| GLAZED BRICKS. | | |
| Best White and Ivory Glazed Stretchers | 12 0 0 | " " " |
| Headers | 11 0 0 | " " " |
| Quoins, Bullnose, and Flats | 16 0 0 | " " " |
| Double Stretchers | 19 0 0 | " " " |
| Double Headers | 16 0 0 | " " " |
| One Side and two Ends | 19 0 0 | " " " |
| Two Sides and one End | 20 0 0 | " " " |
| Splays, Chamferred, Squints | 20 0 0 | " " " |
| Best Dipped Salt Glazed Stretchers, and Header | 12 0 0 | " " " |
| Quoins, Bullnose, and Flats | 14 0 0 | " " " |
| Double Stretchers | 15 0 0 | " " " |
| Double Headers | 14 0 0 | " " " |
| One Side and two Ends | 15 0 0 | " " " |
| Two Sides and one End | 15 0 0 | " " " |
| Splays, Chamferred, Squints | 14 0 0 | " " " |
| Second Quality White and Dipped Salt Glazed | 2 0 0 | " less than best. |

| | s. d. | |
|---|---|---|
| Thames and Pit Sand | 7 0 | per yard, delivered |
| Thames Ballast | | |
| Best Portland Cement | 6 | per ton, " |
| Best Ground Blue Lias | 20 0 | " " |

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at railway depôt.

### STONE.

| | s. d. | |
|---|---|---|
| BATH STONE—delivered on road waggons, Paddington Depôt | 1 8½ | per ft. cube. |
| Do. do. delivered on road waggons, Nine Elms Depôt | 1 8¼ | " " |
| PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf | 2 1 | " " |
| White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf | 2 2½ | " " |

| | s. d. | |
|---|---|---|
| Ancaster in blocks | 1 11 | per ft. cube, deld. rly. depôt. |
| Beer " | 1 6 | " " |
| Greenshill " | 1 10 | " " |
| Darley Dale in blocks | 2 4 | " " |
| Red Corsehill " | 2 5 | " " |
| Closeburn Red Freestone | 2 0 | " " |
| Red Mansfield " | 2 4 | " " |
| YORK STONE—*Robin Hood Quality.* | | |
| Scappled random blocks | 2 10 | " " |
| 6 in. sawn two sides landings to sizes (under 40 ft. super.) | 2 3 | per ft. super. " |
| 6 in. rubbed two sides ditto, ditto | 2 6 | " " |
| 3 in. sawn two sides slabs (random sizes) | 0 11½ | " " |
| 2 in. to 2½ in. sawn one side slabs (random sizes) | 0 7½ | " " |
| 1½ in. to 2 in. ditto, ditto | 0 6 | " " |
| HARD YORK— | | |
| Scappled random blocks | 3 0 | per ft. cube, " |
| 6 in. sawn two sides, landings to sizes (under 40 ft. super.) | 2 8 | per ft. super. " |
| 6 in. rubbed two sides ditto | 3 0 | " " |
| 3 in. sawn two sides (slabs random sizes) | 1 2 | " " |
| 2 in. self-faced random flags | 0 5 | " " |

| | s. d. | |
|---|---|---|
| Hopton Wood (Hard Bed) in blocks | 2 0 | per ft. cube, deld. rly. depôt. |
| " " " 6 in. sawn both sides landings | 2 7 | per ft. super. deld. rly. depôt. |
| " " " 3 in. sawn both sides random slabs | 1 0 | " " |
| " " " 2 in. do. | 0 8½ | " " |

### SLATES.

| in. in. | £ s. d. | |
|---|---|---|
| 20 × 10 best blue Bangor | 13 2 6 | per 1000 of 1200 at r. d. |
| 20 × 12 " " | 13 17 6 | " " |
| 20 × 10 first quality " | 13 0 0 | " " |
| 20 × 12 " " " | 13 15 0 | " " |
| 16 × 8 " " " | 7 5 0 | " " |
| 20 × 10 best blue Portmadoc | 12 12 6 | " " |
| 16 × 8 " " | 6 12 6 | " " |
| 20 × 10 best Eureka unfading green | 15 17 6 | " " |
| 20 × 12 " " | 18 7 6 | " " |
| 18 × 10 " " | 13 5 0 | " " |
| 16 × 8 " " | 10 5 0 | " " |
| 20 × 10 permanent green | 11 12 6 | " " |
| 18 × 10 " " | 9 12 6 | " " |
| 16 × 8 " " | 6 12 6 | " " |

### TILES.

| | s. d. | |
|---|---|---|
| Best plain red roofing tiles | 42 0 | per 1000 at rly. depôt. |
| Hip and Valley tiles | 3 7 | per doz. " " |
| Best Brosely tiles | 50 0 | per 1000 " " |
| Do. Ornamental tiles | 52 6 | " " " |
| Hip and Valley tiles | 4 0 | per doz. " " |
| Best Ruabon red, brown, or brindled do. (Edwards) | 57 6 | per 1000 " " |
| Do. Ornamental do | 60 0 | " " " |
| Hip tiles | 4 0 | per doz. " " |
| Valley tiles | 3 0 | " " " |
| Best Red or Mottled Staffordshire do. (Peakes) | 51 9 | per 1000 " " |
| Do. Ornamental do | 54 6 | " " " |
| Hip tiles | 4 1 | per doz. " " |
| Valley tiles | 3 8 | " " " |
| Best "Rosemary" brand plain tiles | 48 0 | per 1000 " " |
| Best Ornamental tiles | 50 0 | " " " |
| Hip tiles | 4 0 | per doz. " " |
| Valley tiles | 3 8 | " " " |
| Best "Hartshill" brand plain tiles, sand faced | 50 0 | per 1000 " " |
| Do. pressed | 47 6 | " " " |
| Do. Ornamental do | 50 0 | " " " |
| Hip tiles | 4 0 | per doz. " " |
| Valley tiles | 3 6 | " " " |

### WOOD.

| BUILDING WOOD. | At per standard. £ s. d. | £ s. d. |
|---|---|---|
| Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in | 13 10 0 | 15 0 0 |
| Deals: best 3 by 9 | 13 0 0 | 14 0 0 |
| Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in. | 11 0 0 | 12 0 0 |
| Battens: best 2½ by 6 and 3 by 6 | 0 10 0 | less than 7 in. and 8 in. |
| Deals: seconds | 1 0 0 | less than best. |
| Battens: seconds | 0 10 0 | " " " |
| 2 in. by 4 in. and 2 in. by 6 in. | 9 0 0 | 10 0 0 |
| 2 in. by 4½ in. and 2 in. by 5 in. | 8 10 0 | 9 10 0 |
| Foreign Sawn Boards— | | |
| 1 in. and 1¼ in. by 7 in. | 0 10 0 | more than battens. |
| ¾ in. | 1 0 0 | " |
| | At per load of 50 ft. | |
| Fir timber: best middling Dantzig or Memel (average specification) | 4 10 0 | 5 0 0 |
| Seconds | 4 0 0 | 4 10 0 |
| Small timber (6 in. to 10 in.) | 3 2 6 | 3 15 0 |
| Small timber (6 in. to 8 in.) | 3 0 0 | 3 10 0 |
| Swedish balks | 2 15 0 | 3 0 0 |
| Pitch-pine timber (50 ft. average) | 3 5 0 | 3 15 0 |

### WOOD (*continued*).

| JOINERS' WOOD. | At per standard. £ s. d. | £ s. d. |
|---|---|---|
| White Sea: first yellow deals, 3 in. by 11 in | 24 0 0 | 25 0 0 |
| 3 in. by 9 in. | 22 0 0 | 23 0 0 |
| Battens, 2½ in. and 3 in. by 7 in. | 16 10 0 | 18 0 0 |
| Second yellow deals, 3 in by 11 in. | 18 10 0 | 20 0 0 |
| " " 3 in. by 9 in. | 17 10 0 | 19 0 0 |
| Battens, 2½ in. and 3 in. by 7 in. | 13 10 0 | 14 10 0 |
| Third yellow deals, 3 in. by 11 in. and 9 in. | 13 10 0 | 15 0 0 |
| Battens, 2½ in. and 3 in. by 7 in. | 11 0 0 | 12 0 0 |
| Petersburg: first yellow deals, 3 in. by 11 in. | 21 0 0 | 22 10 0 |
| Do. 3 in. by 9 in. | 18 0 0 | 19 10 0 |
| Battens | 13 10 0 | 15 0 0 |
| Second yellow deals, 3 in. by 11 in. | 16 0 0 | 17 0 0 |
| Do. 3 in. by 9 in. | 14 10 0 | 16 0 0 |
| Battens | 11 0 0 | 12 10 0 |
| Third yellow deals, 3 in. by 11 in. | 13 0 0 | 14 0 0 |
| Do. 3 in. by 9 in. | 12 10 0 | 14 0 0 |
| Battens | 10 0 0 | 11 0 0 |
| White Sea and Petersburg:— | | |
| First white deals, 3 in. by 11 in. | 14 10 0 | 15 10 0 |
| " " 3 in. by 9 in. | 13 10 0 | 14 10 0 |
| Battens | 11 0 0 | 12 0 0 |
| Second white deals, 3 in. by 11 in. | 13 10 0 | 14 10 0 |
| " " 3 in. by 9 in. | 12 10 0 | 13 10 0 |
| " " battens | 10 0 0 | 11 0 0 |
| Pitch-pine: deals | 16 10 0 | 20 0 0 |
| Under 2 in. thick extra | 0 10 0 | 1 0 0 |
| Yellow Pine—First, regular sizes | 40 0 0 | upwards. |
| Oddments | 28 0 0 | " |
| Seconds, regular sizes | 30 0 0 | " |
| Yellow Pine oddments | 25 0 0 | " |
| Kauri Pine—Planks, per ft. cube | 0 3 6 | 0 5 0 |
| Danzig and Stettin Oak Logs— | | |
| Large, per ft. cube | 0 3 0 | 0 3 6 |
| Small " " | 0 2 6 | 0 2 9 |
| Wainscot Oak Logs, per ft. cube | 0 5 0 | 0 5 6 |
| Dry Wainscot Oak, per ft. sup. as inch | 0 0 8 | 0 0 9 |
| ¾ in. do. do. | 0 0 7 | — |
| Dry Mahogany—Honduras, Tabasco, per ft. super. as inch | 0 0 9 | 0 1 0 |
| Selected, Figury, per ft. sup. as inch | 0 1 6 | 0 2 6 |
| Dry Walnut, American, per ft. sup. as inch | 0 0 10 | 0 1 0 |
| Teak, per load | 17 0 0 | 21 0 0 |
| American Whitewood Planks, per ft. cube | 0 4 0 | 0 5 0 |
| Prepared Flooring, etc.— | Per square. | |
| 1 in. by 7 in. yellow, planed and shot | 0 13 6 | 0 17 6 |
| 1 in. by 7 in. yellow, planed and matched | 0 14 0 | 0 18 0 |
| 1¼ in. by 7 in. yellow, planed and matched | 0 16 0 | 1 0 0 |
| 1 in. by 7 in. white, planed and shot | 0 12 0 | 0 14 6 |
| 1 in. by 7 in. white, planed and matched | 0 12 6 | 0 15 0 |
| 1¼ in. by 7 in. white, planed and matched | 0 15 0 | 0 16 6 |
| ¾ in. by 7 in. yellow, matched and beaded or V-jointed brds. | 0 11 0 | 0 13 6 |
| 1 in. by 7 in. do. do. | 0 14 0 | 0 18 0 |
| ¾ in. by 7 in. white do. do. | 0 10 0 | 0 11 6 |
| 1 in. by 7 in. do. do. do. | 0 12 9 | 0 15 0 |

6 in. at 6d. to 9d. per square less than 7 in.

### JOISTS, GIRDERS, &c.

| | In London, or delivered Railway Vans, per ton. £ s. d. | £ s. d. |
|---|---|---|
| Rolled Steel Joists, ordinary sections | 5 15 0 ... | 6 15 0 |
| Compound Girders, ordinary sections | 7 5 0 ... | 8 7 6 |
| Steel Compound Stancheons | 9 2 6 ... | 10 12 6 |
| Angles, Tees and Channels, ordinary sections | 7 7 6 ... | 8 7 6 |
| Flitch Plates | 7 15 0 ... | 8 5 0 |
| Cast Iron Columns and Stanchions including ordinary patterns | 6 12 6 ... | 7 15 0 |

### METALS.

| | Per ton, in London. £ s. d. | £ s. d. |
|---|---|---|
| IRON— | | |
| Common Bars | 7 0 0 ... | 7 10 0 |
| Staffordshire Crown Bars, good merchant quality | 7 10 0 ... | 8 0 0 |
| Staffordshire "Marked Bars" | 9 10 0 ... | — |
| Mild Steel Bars | 8 5 0 ... | 8 15 0 |
| Hoop Iron, basis price | 8 15 0 ... | 9 0 0 |
| " " Galvanized | 16 10 0 ... | — |
| (*And upwards, according to size and gauge.) | | |
| Sheet Iron, Black— | | |
| Ordinary sizes to 20 g. | 9 0 0 ... | — |
| " " 24 g. | 10 0 0 ... | — |
| " " 26 g. | 11 15 0 ... | — |
| Sheet Iron, Galvanised, flat, ordinary quality— | | |
| Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g. | 12 10 0 ... | — |
| Ordinary sizes to 22 g. and 24 g. | 13 0 0 ... | — |
| " " 26 g. | 14 0 0 ... | — |
| Sheet Iron, Galvanised, flat, best quality— | | |
| Ordinary sizes to 20 g. | 15 10 0 ... | — |
| " " 22 g. and 24 g. | 16 0 0 ... | — |
| " " 26 g. | 17 10 0 ... | — |
| Galvanised Corrugated Sheets— | | |
| Ordinary sizes 6 ft. to 8 ft. 20 g. | 12 10 0 ... | — |
| " " 22 g. and 24 g. | 13 0 0 ... | — |
| " " 26 g. | 13 15 0 ... | — |
| Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker | 11 0 0 ... | — |
| Best Soft Steel Sheets, 22 g. & 24 g. | 12 0 0 ... | — |
| " " " 26 g. | 13 10 0 ... | — |
| Cut nails, 3 in. to 6 in. | 9 0 0 ... | 9 10 0 |
| (Under 3 in., usual trade extras.) | | |

### LEAD, &c.

| | Per ton, in London. £ s. d. | £ s. d. |
|---|---|---|
| LEAD—Sheet, English, 3lb. and up | 15 5 0 ... | — |
| Pipe in coils | 15 15 0 ... | — |
| Soil pipe | 18 5 0 ... | — |
| Compo pipe | 18 5 0 ... | — |
| ZINC—Sheet— | | |
| Vieille Montagne ..... ton | 30 15 0 ... | — |
| Silesian | 30 10 0 ... | — |

PRICES CURRENT.—*Continued on page 481.*

# COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

*(For some Contracts, etc., still open, but not included in this List, see previous issues.)*

## COMPETITIONS.

| Nature of Work. | By whom Required. | Premiums. | Designs to be Delivered |
|---|---|---|---|
| Reconstruction of City Hall, Perth (Cost, 6,000*l.*) .. | Perth Town Council..... | 30, 20, and 10 guineas ..... | Aug. 1 |
| Erecting a City Hall (Cost, 15,000*l.*) ..... | do. | 50, 30, and 20 guineas..... | do. |

## CONTRACTS.

| Nature of Work or Materials. | By whom Advertised. | Forms of Tender, etc., supplied by | Tenders to be Delivered |
|---|---|---|---|
| Cement Plastering, etc., Modbury Reservoir ..... | Modbury Parish Council..... | White Hart Hotel, Modbury ..... | April 29 |
| Roads, etc. (Queen's-grove-road, etc.) ..... | Chingford U.D.C. ..... | W. Stair, Surveyor, 34, Station-road, Chingford..... | do. |
| Repairs and Alterations, Hexham Police-station, etc. | Northumberland C.C. ..... | J. A. Bean, County Surveyor, Moot Hall, Newcastle-on-Tyne.... | April 30 |
| 1,000 tons of Portland Cement ..... | Torquay Town Council ..... | S. C. Chapman, Water Engineer, Torquay ..... | May 1 |
| Wood-Paving Works ..... | Royal Borough of Kensington .... | W. Weaver, Borough Eng. and Surveyor, Town Hall, Kensington | do. |
| Scavenging and Team Work ..... | Mountain Ash U.D.C. ..... | W. G. Thomas, Architect, Public Offices, Mountain Ash ..... | do. |
| Villa, Stotfield, Lossiemouth ..... | ..... | J. Wittet, Architect, Elgin ..... | do. |
| Cutting Trees, Levelling, Trenching, etc. ..... | ..... | do. | do. |
| Tool House, Spynie Churchyard ..... | ..... | do. | do. |
| 1,000 tons of Dry Sand Cast-Iron Pipes, etc. ..... | Lanarkshire Middle Ward Dis. Com. | J. & A. Leslie & Reid, C.E., 72A, George-street, Edinburgh..... | do. |
| 920 tons of Dry Sand Cast-Iron Pipes ..... | do. | do. | do. |
| Road Materials ..... | Stocksbridge U.D.C. ..... | J. Marsden, Clerk, Council Offices, Stocksbridge ..... | do. |
| Alterations at Guildhall, Windsor ..... | New Windsor Town Council ..... | Borough Surveyor, Alma-road, Windsor ..... | do. |
| Baptist Chapel and School-room, Bridgend ..... | ..... | P. J. Thomas, Architect and Surveyor, Bridgend ..... | do. |
| Roads & Surface-water Drains, Gelly Deg Ishaf Estate | ..... | I. Jones & T. E. Richards, Archs. & Survs., 18, St. Mary-st., Cardiff | do. |
| Alters. & adds. to Choir Gallery, Wes. Ch., Wimborne | ..... | At the Vestry, Wimborne ..... | do. |
| Timber and Concrete Pier, etc., Oban ..... | Commissioners of North. Lighthouses | D. A. Stevenson, Engineer, 84, George-street, Edinburgh ..... | do. |
| Four Houses, etc., in Healds-road, Dewsbury Moor | ..... | J. Barton & Son, Architects and Surveyors, Halifax-rd., Dewsbury | do. |
| Two Houses and Stabling, Hartley-street, Dewsbury | ..... | do. | do. |
| Roof of Dewsbury Pioneers' Industrial Soc. Warehouse | ..... | Holtom & Fox, Architects, Corporation-street, Dewsbury ..... | do. |
| 500 tons of Portland Cement ..... | Hastings Corporation ..... | P. H. Palmer, Borough Engineer, Town Hall, Hastings ..... | do. |
| Making-up Hollingbourne Gardens..... | Ealing Town Council ..... | C. Jones, Borough Engineer, Town Hall, Ealing, W..... | May 2 |
| Pumping Machinery ..... | Swinton U.D.C..... | R. Fowler, Engineer, Council Offices, Swinton, near Rotherham.. | do. |
| Supplies ..... | Gt. Crosby U.D.C. ..... | W. Hall, C.E., Surveyor, Council Offices, College-road, Gt. Crosby | do. |
| Brick Wall, Lyndhurst-road and Ham-road ..... | Worthing Corporation ..... | Borough Surveyor, Liverpool-road, Worthing ..... | do. |
| Farm Buildings, Bridlington ..... | Mr. J. H. Hutchinson's Trustees .. | J. Earnshaw, Architect, Carlton House, Bridlington ..... | do. |
| Disinfector House, Mortuary, etc., Hartshead ..... | Ashton-under-Lyne Hospital Board. | J. Lowe, Surveyor, Town Hall-chambers, Ashton ..... | do. |
| Wire Lift Ropes, Infirmary, Leytonstone ..... | West Ham Guardians ..... | F. E. Hilleary, Clerk, Union Workhouse, Leytonstone, E. ..... | May 3 |
| Stonework, Buildwas Bridge ..... | Salop C.C. ..... | A. T. Davis, County Surveyor, Shirehall, Shrewsbury ..... | do. |
| Waterworks, Whitehead ..... | Mr. J. R. Raphael ..... | J. A. Hanna, Engineer, Ocean-buildings, Belfast ..... | do. |
| Sewerage Tanks at Brynna ..... | Cowbridge R.D.C..... | G. E. Morris, Surveyor and Engineer ..... | do. |
| New Road, St. Donats, Llantwit-Major ..... | ..... | Clerk of Works Office, St. Donats Castle, Llantwit-Major ..... | do. |
| Alterations to premises, 16, Fore-street, Tiverton .. | ..... | W. Barrows, Deepway, Tiverton ..... | do. |
| Two Villas at Seascale, Cumberland ..... | Miss Wilson and Mr. Postlethwaite.. | A. Huddart, Architect, 9, Lowther-street, Whitehaven..... | do. |
| Disinfectants ..... | Wood Green U.D.C..... | A. E. Adams, Sanitary Inspector, Town Hall, Wood Green..... | do. |
| *Condenser Piping, Sump and River Work ..... | Fulham Borough Council ..... | Borough Engineer, Town Hall, Fulham, S.W. ..... | do. |
| *Steel Roof and Bunker Work ..... | do. | do. | do. |
| *Coal-Conveying Apparatus ..... | do. | do. | do. |
| Road, St. Mary's Estate, Winchester..... | ..... | J. Harris & Son, Jewry-chambers, Winchester ..... | May 4 |
| Scavenging, Rainhill ..... | Whiston R.D.C. ..... | G. S. Fraser, Delph-lane, Whiston..... | do. |
| Smallpox Hospital, Lower Taylorton..... | Stirling Combination Hospital Com. | A. H. Goudie, Burgh-buildings, Stirling ..... | do. |
| Pair of Houses, Glendale-road, Wooler ..... | Mr. G. Robson ..... | G. Reavell, jun., Architect, Alnwick..... | do. |
| 250 tons of 7-in. Girder Rails ..... | Southampton Corporation ..... | H. F. Street, Borough Electrical Engineer, Southampton..... | May 5 |
| Reconstruction of Tramways, Portswood-road..... | do. | do. | do. |
| Villa Residence, Walls, etc., Barkisland..... | ..... | C. H. Petty, Architect, 12, Waterhouse-street, Halifax..... | do. |
| *Erection of Police-station, Maidenhead ..... | Berks Standing Joint Committee .. | J. Morris, County Surveyor, Broadway-buildings, Reading ..... | do. |
| *Painting etc., at Schools, Upton Park ..... | St. George-in-the-East Guardians .. | Clerk's Office, Rame-street, Old Gravel-lane, E..... | do. |
| Work at Bishop Sutton Council Schools ..... | Somerset C.C. ..... | Mr. F. Bird, Architect, Midsomer Norton, Somerset ..... | May 6 |
| Four Houses, Gilfach, Pengam ..... | ..... | W. Harris, Architect, Gilfach ..... | do. |
| Two Lift Gasholder ..... | Newton-in-Makerfield U.D.C..... | A. Bowes, Gas Engineer, Town Hall, Earlestown ..... | do. |
| Pair of Cottages at St. Michael, Penkivel, Cornwall | Rt. Hon. Viscount Falmouth..... | Tregothnan Office, Truro (G. Gow) ..... | do. |
| Cartage..... | Windsor R.D.C. ..... | W. Menzies, Surveyor, Englefield-green Surrey ..... | do. |
| Road Materials and Team Labour ..... | Lexden and Winstree R.D.C..... | J. Ennals, Surveyor's Office, Copford, near Colchester ..... | do. |
| Infant Schools, Powick ..... | Worcestershire C.C. ..... | A. Hill Parker, F.R.I.B.A., 5, Foregate-street, Worcester ..... | do. |
| Repair, Painting, etc., Lych Gate, Charminster .... | Parish Council ..... | T. A. Pearce, Clerk, Charminster, Dorchester ..... | do. |
| Painting, etc, Bier House, Charminster ..... | do. | do. | do. |
| Cement Concrete Footpaths..... | Loanhead Town Council ..... | J. Somerael Carfrae, C.E., 1, Erskine-place, Edinburgh ..... | do. |
| Slack and Ash Plant ..... | Huddersfield Corporation ..... | A. B. Mountain, Boro. Elec. Eng., St. Andrew's-rd., Huddersfield | May 8 |
| Excavating for Plant..... | do. | do. | do. |
| Cottage at Outfall Works, Water-lane, Ilford ..... | Ilford U.D.C..... | H. Shaw, Engineer and Surveyor, Town Hall, Ilford..... | do. |
| Painting, etc., Welsh Calvinistic Ch., Rhosllanerchrugog | ..... | J. Rogers, Secretary, High-street, Rhos, Ruabon ..... | do. |
| Repairs, Landrake Church Tower ..... | ..... | F. J. Behenna, Landrake Vicarage, St. Germans, R.S.O..... | do. |
| Two Water-Tube Boilers, Victoria-road ..... | Kirkcaldy Corporation ..... | Burgh Electrical Engineer, Electricity Works, Kirkcaldy..... | do. |
| Granite and Flints..... | Southampton Corporation ..... | J. A. Crowther, Boro' Engineer, Market-chambers, Southampton | do. |
| Conver. of Disused Gasholder Tank into Storage Tank | Brighouse Corporation ..... | J. Parkinson, Engineer, Gasworks, Mill-lane, Brighouse ..... | do. |
| Supplies, Gas and Water Department ..... | Barry U.D.C..... | F. M. Harris, Engineer Gasworks, Barry ..... | do. |
| Buildings, Bridgwater ..... | Co-Operative Society ..... | J. W. Hill, Architect, King-street-chambers, Bridgwater ..... | do. |
| Chapel, Bridgend-road, Aberkenfig..... | Carey Baptist Church ..... | J. & F. J. Hurley, Architects, 10, Bridgend-road, Aberkenfig .... | do. |
| Pair of Dock Gates, Queen's Dock Entrance ..... | Whitehaven Harbour Commissioners | J. Tyson, Clerk, Harbour Office, Whitehaven ..... | do. |
| Baptist School Chapel, Cathays ..... | The Trustees ..... | W. Beddoe Rees, Architect, 3, Dumfries-place, Cardiff..... | do. |
| *Road-making Works ..... | Hendon U.D.C..... | Council's Engineer, Council Offices, Hendon, N.W..... | do. |
| Road Stone, etc..... | Great Western Railway Co. ..... | G. K. Mills, Secretary, Paddington Station, London ..... | May 9 |
| Station Buildings, Aberdare ..... | do. | Engineer at Neath Station ..... | do. |
| *New Carriage Shed, etc. Acton ..... | do. | Engineer's Office, Paddington, W..... | do. |
| *Erection of Thirty-six Houses at Cardiff ..... | do. | Engineer's Office, Newport Station ..... | do. |
| -tores ..... | Richmond Main Sewerage Board .. | W. Fairley, Engineer, West Hall-road, Kew Gardens, S.W. ..... | do. |
| Temp. Shelter in conx. with Hospital, Chadwell Heath | Ilford U.D.C..... | H. Shaw, Engineer and Surveyor, Town Hall, Ilford..... | do. |
| Schools, Aberdare ..... | U.D.C. ..... | J. Morris, Town Hall, Aberdare ..... | do. |
| Converting Store into Mortuary at Asylum, Knowle | Visiting Committee ..... | W. J. Taylor, County Surveyor, The Castle, Winchester ..... | do. |
| Broken Granite ..... | West Ashford R.D.C. ..... | A. Sims, Surveyor to Council, Charing..... | do. |
| *Extension of Electric Light Generating Station .... | Portsmouth Town Council ..... | Town Hall, Portsmouth ..... | do |
| Widening part of Consett Branch Railway, Blaydon | North Eastern Railway Co. ..... | C. A. Harrison, Engineer, Central Station, Newcastle-on-Tyne .. | May 10 |
| Curve between Consett and Redheugh ..... | do. | do. | do. |
| *Painting Stockton Passenger Station, etc..... | Directors North Eastern Ry. Co. .. | J. C. Valentine, Engineer, Northgate Offices, Darlington ..... | do. |
| Materials, Street Works ..... | Bradford Corporation ..... | J. H. Cox, City Surveyor, Town Hall, Bradford..... | do. |
| Private Street Improvement Works ..... | Twickenham U.D.C..... | F. W. Pearce, Surveyor, Town Hall, Twickenham ..... | do. |
| Granite..... | Faversham R.D.C. ..... | J. G. Chittenden, District Surveyor, Ashford-road, Faversham .. | do. |
| Water Supply Works, Chulmleigh ..... | South Molton R.D.C. ..... | F. Day, Clerk, South Molton ..... | do. |
| Schools, Rood End..... | Oldbury Education Committee .... | A. Long, Architect, New-street, West Bromwich ..... | May 11 |
| Street Improve., Smawthorne-gr. and Roundhill-rd. | Castleford U.D.C..... | W. Green, Surveyor, Castleford ..... | do. |
| Detached House at Wilsden, Yorks ..... | ..... | Wilson Bailey, Architect, Tanfield-buildings, Bradford ..... | do. |

## CONTRACTS.—*Continued.*

| Nature of Work or Materials. | By whom Advertised. | Forms of Tender, etc., supplied by | Tenders to be Delivered |
|---|---|---|---|
| Measuring Basin, etc., at Talla Reservoir | Edinburgh & District Water Trustees | W. A. Tait, C.E., 72A, George-street, Edinburgh | May 11 |
| Three Cottages, Charles-street, Dorchester | Oddfellows' Friendly Society | F. T. Maltby, A.M.Inst.C.E., Dorchester | do. |
| *Panelling and Seating Council Chamber in Town Hall | County Borough of Cardiff | Town Clerk, Town Hall, Cardiff | do. |
| Structural Ironwork for 1,000 ft. of Wharf | Karáchi Port Trust | D. Morris, M.Inst.C.E., 65, Cornhill, E.C. | May 12 |
| Concrete Slab Paving | Worcester Highways Committee .. ..... ..... | J. H. Garrett, County Road Surveyor, Shirehall, Worcester | do. |
| Girder Bridge over the Wansbeck at Low Angerton | | J. M. MacGregor, C.E., 14, Market-place, Morpeth | May 13 |
| Masonry Bridge over River Font at Shelly | | do. | do. |
| Council School, Tiverton-road, Selly Oak | King's Norton and Northfield U.D.C. | E. Holmes, Architect, 10, Exchange-chambers, New-st., Birmingham | do. |
| Twin Set of Exhausters and Engine, Bradford-rd. Stn. | Manchester Corporation | C. Nickson, Gas Department, Town Hall, Manchester | do. |
| Girls' School, Locking-road, Weston-super-Mare | Somerset County Education Com. | H. F. Price, & W. Jane, & S. J. Wilde & Fry, Architects, Weston | do. |
| School, etc., High-street, Barry | Barry U.D.C. | G. A. Birkenhead, Architect, Caledonian-chambers, Cardiff | do. |
| School, etc., Caegarw, Mountain Ash | Mountain Ash Education Committee | W. G. Thomas, Architect, Public Offices, Mountain Ash | do. |
| Concrete Steps at Marina | Ramsgate Corporation | T. G. Taylor, Borough Surveyor, Albion House, Ramsgate | do. |
| Alterations, etc., to Premises, Convoy | Convoy Woollen Co., Ltd. | M. A. Robinson, Architect, Richmond-street, Londonderry | May 15 |
| Buildings, Electric Lighting Works | Irvine Corporation, Ayrshire | Kirkland & Capper, Engrs., 17, Victoria-st., Westminster, London | do. |
| Power Plant House | do. | do. | do. |
| Mains | do. | do. | do. |
| Enlargement of Chapel, Caeran | Dyffryn Welsh Congregational Ch. | D. J. Davies, Secretary, Tonnau-road, Caeran | do. |
| Schoolrooms, Caeran | do. | do. | do. |
| Superstructure of Two Transit Sheds, Canon's Marsh | Bristol Docks Committee | W. W. Squire, Engineer, Cumberland-road, Bristol | do. |
| *Supply of Wood Paving Blocks | St. Marylebone Borough Council .. ..... | Borough Surveyor, Town Hall, Marylebone-lane, W. | do. |
| Primitive Methodist Church, Broadoak, Garway | | J. E. Bowen, 73, Monnow-street, Monmouth | May 19 |
| Schools, Stonefield, Bilston | Bilston U.D.C. | Bailey & McConnall, Architects, Bridge-street, Walsall | May 20 |
| Sewerage of Clewer Without | Windsor R.D.C. | A. M. Fowler, Engineer, 23, Montague-st., Russell-square, London | do. |
| 1,000 tons of Granite | Stevenage U.D.C. | W. Onslow Times, Clerk, Urban District Council Offices, Stevenage | May 22 |
| *Block of Bldgs at Baddow-rd. Hospl. nr. Chelmsford | Chelmsford Joint Hospital Board | Clerk to the Board, 96, High-street, Chelmsford | do. |
| Passenger Rolling Stock | East Argentine Railway Co., Ltd. | R. J. Fennessy, Sec., Winchester House, 50, Old Broad-st., London | May 24 |
| Sewage Outfall Works | Christchurch Corporation | C. J. Lomax, Engineer, 28, Victoria-street, Westminster, S.W. | May 30 |
| Self-Propelling Barge-Loading Dredger | Hartlepool Port & Harbour Commis. | J. D. Howkins, Engineer to Harbour Commission | June 15 |
| Twin-Screw Steam-Hopper Barge | do. | do. | do. |
| Re-erection of Terminus Hotel, Brampton | Crown Hotel, Chesterfield | W. H. Wagstaff, Architect, 57, Salter-gate, Chesterfield | No date. |
| 30,000 c. yds., Brick or Stone, Granite Chippings, etc. | ..... | J. S. Pickering, Borough Surveyor, Municipal Offices, Cheltenham | do. |
| Galleries, Congregational Chapel, Kingswood | ..... | La Trobe & Weston, Architects, 44, Corn-street, Bristol | do. |
| Work at Arley Congregational Chapel, Cheltenham-rd. | ..... | A. Harford, Architect, 6 and 7, St. Stephen-street, Bristol | do. |
| *Erection of Semi-detached Houses, near Spalding | ..... | J. Carter, Jonas, & Sons, Cambridge | do. |

## PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom Advertised. | Salary. | Application to be in |
|---|---|---|---|
| *Foreman, Public Works Department | Southern Nigeria P.W. Department | 250*l.*, etc. | May 8 |

*Those marked with an (*) are advertised in this number.* *Competitions*, —. *Contracts*, iv. vi. viii. x. *Public Appointments*, xxii.

PRICES CURRENT—*Continued from page 479.*

LEAD, &c. (*continued*)—

| | Per ton, in London. £ s. d. | £ s. d. |
|---|---|---|
| COPPER— | | |
| Strong Sheet.....per lb. | 0 0 10 ... | — |
| Thin „ ..... „ | 0 0 11 ... | — |
| Copper nails ..... „ | 0 0 10 ... | — |
| BRASS— | | |
| Strong Sheet..... „ | 0 0 9½ ... | — |
| Thin „ ..... „ | 0 0 10 ... | — |
| TIN—English Ingots ..... „ | 0 1 4½ ... | — |
| SOLDER—Plumbers' ..... „ | 0 0 6½ ... | — |
| Tinmen's..... „ | 0 0 8 ... | — |
| Blowpipe..... „ | 0 0 9 ... | — |

ENGLISH SHEET GLASS IN CRATES.

| | |
|---|---|
| 15 oz. thirds ..... | 2¾d. per ft. delivered. |
| „ fourths..... | 2d. „ „ |
| 21 oz. thirds ..... | 3¾d. „ „ |
| „ fourths..... | 3d. „ „ |
| 26 oz. thirds ..... | 4¾d. „ „ |
| „ fourths..... | 3¾d. „ „ |
| 32 oz. thirds ..... | 5¾d. „ „ |
| „ fourths..... | 5d. „ „ |
| Fluted Sheet, 15 oz..... | 3¼d. „ „ |
| „ 21 oz..... | 4¼d. „ „ |
| ½ Hartley's Rolled Plate ..... | 2d. „ „ |
| ⅓ „ „ „ ..... | 2¼d. „ „ |
| ¼ „ „ „ ..... | 2½d. „ „ |

| OILS, &c. | | £ s. d. |
|---|---|---|
| Raw Linseed Oil in pipes ..... | per gallon | 0 1 7 |
| „ „ „ in barrels ..... | „ | 0 1 8 |
| „ „ „ in drums..... | „ | 0 1 10 |
| Boiled „ „ in pipes ..... | „ | 0 1 9 |
| „ „ „ in barrels ..... | „ | 0 1 10 |
| „ „ „ in drums..... | „ | 0 2 0 |
| Turpentine, in barrels ..... | „ | 0 3 8 |
| „ in drums..... | „ | 0 3 10 |
| Genuine Ground English White Lead | per ton | 19 15 0 |
| Red Lead, Dry ..... | „ | 19 5 0 |
| Best Linseed Oil Putty ..... | per cwt. | 0 6 6 |
| Stockholm Tar ..... | per barrel | 1 12 0 |

| VARNISHES, &c. | Per gallon. £ s. d. |
|---|---|
| Fine Pale Oak Varnish ..... | 0 8 0 |
| Pale Copal Oak ..... | 0 10 6 |
| Superfine Pale Elastic Oak ..... | 0 12 6 |
| Fine Extra Hard Church Oak..... | 0 10 0 |
| Superfine Hard-drying Oak, for seats of Churches ..... | 0 14 0 |
| Fine Elastic Carriage..... | 0 12 6 |
| Superfine Pale Elastic Carriage ..... | 0 16 0 |
| Fine Pale Maple ..... | 0 16 0 |
| Finest Pale Durable Copal ..... | 0 18 0 |
| Extra Pale French Oil ..... | 1 1 0 |
| Eggshell Flatting Varnish ..... | 0 18 0 |
| White Copal Enamel ..... | 1 4 0 |
| Extra Pale Paper ..... | 0 12 0 |
| Best Japan Gold Size ..... | 0 10 6 |
| Best Black Japan..... | 0 16 0 |
| Oak and Mahogany Stain ..... | 0 9 0 |
| Brunswick Black ..... | 0 8 6 |
| Berlin Black ..... | 0 16 0 |
| Knotting ..... | 0 10 0 |
| French and Brush Polish ..... | 0 10 0 |

## TERMS OF SUBSCRIPTION.

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## TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABBOTS LANGLEY (Herts). — For the erection of a seven-roomed house and bath-room, for Mr. G. W. Saull. Messrs. Barrett & Driver, architects, 23, York-place, Baker-street, S.W. :—

| | | | |
|---|---|---|---|
| Flint Bros..... | £385 0 | E. Glenister. | |
| W. T. Halse .... | 339 0 | Abbots Langley* | £272 10 |

BANBURY. — For additions and alterations to Shenington Voluntary School, near Banbury. Messrs. Tollit & Lee, architects, 7, St. Aldates', Oxford. Quantities not supplied :—

| | | | |
|---|---|---|---|
| W. Miles ..... | £425 8 | E. Clifton ..... | £395 0 |
| G. Busby ..... | 403 0 | F. Watson ..... | 380 0 |
| L. Poulton ..... | 398 0 | Kingerlee, Oxford* | 313 0 |

BARNARD CASTLE. — For the construction of 1,200 yds. of 6-in. sewers, tanks, etc., at Cockfield, for the Rural District Council Parochial Committee. Mr. R. Brown, Surveyor, Winston :—

| | | | |
|---|---|---|---|
| W. Watson.... | £508 8 2 | W. & J. Collinson ..... | £390 15 6 |
| P. Frater .... | 475 0 0 | J. Clarkson.... | 377 15 1 |
| J. Seward .... | 448 9 0 | S. Walker, Cockfield* ..... | 317 0 0 |
| M. Turnbull & Sons ..... | 440 0 0 | | |
| J. W. Boyd .. | 420 0 0 | | |

BURY.—For erecting engine and boiler houses, chimney, and setting two Lancashire boilers, for the Guardians of the Bury Union. Mr. A. Hopkinson, Assoc.M.Inst.C.E., architect, 15, Agur-street, Bury. Quantities by architect :—

| | | | |
|---|---|---|---|
| C. Dennis ..... | £9,000 | M. Warrington .... | £8,650 |
| Thompson & Brierley ..... | 8,920 | J. Byrom, Ltd., Bury*‡ ..... | 8,500 |
| C. Brierley ..... | 8,899 | Clayton Bros.§ .... | 8,414 |

[Architect's estimate, £8,700.]

‡ Complete in six months. § Complete in nine months.

CLYDEBANK.—For constructing 2,000 yds. of 12-in. and 9 in. pipe sewers, for the Town Council. Mr. G. Ross, Burgh Surveyor, Clyde Bank. Quantities by Surveyor :—

| | | | |
|---|---|---|---|
| R.C. Brebner | £2,700 0 0 | A. Stark & Sons .... | £1,778 5 9 |
| J. McFarlane | 2,524 15 8 | McLaughlan, Anderson | 1,768 11 6 |
| J. Drysdale | 1,999 14 0 | T. Scott.... | 1,591 18 10 |
| A. Duncan . | 1,935 0 1 | J. Hutchison | 1,495 0 0 |
| J. & J. Neilson ..... | 1,926 18 11 | D. Winton, Duntocker* | 1,417 8 1 |
| W. Stewart . | 1,855 11 8 | | |
| Kirkwood, Kerr, & Co. | 1,834 3 4 | | |

[Surveyor's estimate, £1,700.]

DONCASTER.—For erecting two new shops and premises, for Mr. A. Stubbs. Mr. J. Athron, architect, 10, Priory-place, Doncaster. Quantities by architect :—

| | | | |
|---|---|---|---|
| D. Gill & Son | £2,997 0 0 | S. Beastall & Sons, Doncaster* .. | £2,562 15 11 |
| C. Sprakes & Sons .... | 2,850 0 0 | B. Ashton & Sons‡ .... | 2,467 11 3 |
| F. Beastall . | 2,670 0 0 | | |
| Mullins & Richardson | 2,643 15 5 | | |

‡ Withdrawn.

EPSOM.—For extension of sewer in Sutton-road, Cheam, for the Rural District Council. Mr. W. T. Wooldridge, Surveyor, Waterloo-road, Epsom :—

| | | | |
|---|---|---|---|
| R. Noble..... | £442 0 0 | S. Kavanagh & Co. ..... | £349 0 0 |
| W. Hall ..... | 425 0 0 | W. Adamson .. | 331 0 0 |
| A. C. Soan.... | 420 0 0 | J. B. Potter .. | 294 0 0 |
| Williamson & Sons.. .... | 359 0 0 | J. May, Ashtead* | 270 0 0 |
| Strickland & Co. | 350 10 0 | | |

GUILDFORD. — For the superstructure of new casual wards, labour shed and workshops, and quarters for married couples at the Workhouse, for the Guardians. Mr. E. L. Lunn, architect, 36, High-street, Guildford :—

| | | | |
|---|---|---|---|
| Swayne & Son | £6,603 0 0 | W. Smith & Sons ..... | £5,890 0 0 |
| D. Fry ..... | 6,415 0 0 | G. Kemp .... | 5,869 0 0 |
| R. Wood & Son | 6,287 0 0 | Martin, Wells, & Co., Ltd. | 5,800 0 0 |
| S. Ellis ..... | 6,175 0 0 | Higlett & Hammond.. | 5,795 0 0 |
| Tribe & Robinson..... | 6,150 0 0 | McCarthy & E. Fitt .... | 5,739 0 0 |
| R. Smith .... | 5,998 0 0 | Mitchell Bros. | 5,660 0 0 |
| T. H. Kingerlee & Sons.. | 5,967 0 0 | E. C. Hughes, Albion Works, Wokingham* | 5,228 2 6 |
| Mussellwhite & Sapp ..... | 5,945 0 0 | | |
| Higgs & Outhwaite ..... | 5,907 0 0 | | |
| Goddard & Sons ..... | 5,899 0 0 | | |

HANLEY.—For extensions to the Municipal Secondary School, for the Education Committee. Mr. E. E. Scrivener, Architect to Committee, Howard-place, Hanley :—

| | | | |
|---|---|---|---|
| A. Ward ..... | £3,771 0 | T. Godwin, Hanley‡ .... | £3,319 0 |
| Tompkinson & Betteley .... | 3,530 0 | Cornes & Sons . | 3,315 0 |
| J. Bagnall .... | 3,387 0 | P. H. Bennion . | 3,130 15 |

‡ Accepted subject to sanction of Board of Education

HADHAM.—For sinking of a borehole 8½ in. in diameter, 270 ft. deep, with all requisite steel lining tubes; the supply and fixing of No. 2 deep well pumps and No. 2 oil engines, with all necessary fittings and connexions, for the Rural District Council. Messrs. Pollard & Tingle, engineers, 31, Old Queen-street, Westminster, S.W.:—

| | | | |
|---|---|---|---|
| H. G. Featherby | £1,418 | 14 | 2 |
| H. Brown & Co. | 1,330 | 14 | 2 |
| T. Tilley & Sons | 1,261 | 4 | 2 |
| Britannia Engineering Works | 1,236 | 3 | 2 |
| Cheeld & Co. | £1,156 | 4 | 2 |
| J. Thorn | 1,040 | 18 | 8 |
| Duke & Ockenden | 997 | 7 | 8 |
| C. Isler & Co. | 867 | 9 | 2 |
| Crossley Bros.‡ | 766 | 4 | 2 |
| Le Grand & Sutcliff | 745 | 19 | 2 |

‡ Exclusive of boring.

MANCHESTER.—First contract for foundations, Royal Infirmary. Messrs. E. T. Hall, London, and J. Brooke, Manchester, architects:—

| | | | |
|---|---|---|---|
| Morrison & Son | £38,475 | C. H. Normanton & Sons | £26,959 |
| Leslie & Co. | 37,200 | R. Neill & Sons | 26,902 |
| P. Hodkinson | 33,800 | Arnold & Son, Leeds and Doncaster* | 26,360 |
| Foster & Dicksee | 31,970 | | |
| H. Lovatt | 30,418 | | |
| Brown & Sons | 27,000 | | |

MARKET BOSWORTH.—For 235 yds. of 9-in., 162 yds. of 6-in., and 7 yds. 12-in. earthenware pipe sewers, etc., Bagworth, for the Rural District Council. Mr. W. Morton Sykes, Surveyor, Chapel-street, Ibstock:—

| | | | |
|---|---|---|---|
| Orton | £219 | 0 | 0 |
| A. Palmer | 207 | 0 | 0 |
| Hewes Bros. | 204 | 10 | 0 |
| B. Shipman | 193 | 10 | 0 |
| Beck & Son | £174 | 15 | 9 |
| T. Hatter, Hugglescote* | 173 | 0 | 0 |

METHWOLD (Norfolk).—For alterations and additions to the Methwold Non-Provided School. Mr. Arthur J. Lacey, Architect and Diocesan Surveyor, 6, Upper King-street, Norwich:—

| | | | |
|---|---|---|---|
| J. H. Mann | £669 | 0 | 0 |
| H. C. Tofts | 652 | 4 | 7 |
| R. Dye | 649 | 15 | 0 |
| A. E. Chapman | 648 | 0 | 0 |
| Boughton & Sons | 632 | 9 | 6 |
| Atherton & Co. | £603 | 0 | 0 |
| T. Curry Boldry, Methwold† | 547 | 12 | 6 |
| H. A. Collison | 536 | 2 | 10 |
| J. W. Collins | 535 | 0 | 0 |

NEWARK.—For repairing old service reservoir, Beacon Hill, for the Corporation. Mr. G. Sheppard, Borough Surveyor, Newark:—

| | | | |
|---|---|---|---|
| W. Smith | £103 | 7 | 0 |
| Brown & Son | 99 | 10 | 0 |
| C. Baines, Lombard-street, Newark* | £95 | 0 | 0 |

[Surveyor's estimate, £111.]

PONTEFRACT.—For erecting Wesleyan Church and schools, for Sandal, near Wakefield. Messrs. Garside & Pennington, architects, Pontefract. Quantities by architects:—

| | | | |
|---|---|---|---|
| *Brickwork:* Higgins & Pashley, Wakefield* | £1,106 | 3 | 7 |
| *Woodwork:* J. W. Harrop, Ossett* | 694 | 15 | 6 |
| *Plumber:* H. Gillot, Wakefield* | 206 | 15 | 0 |
| *Slaters:* Scholey Bros., Beeston Hill, Leeds* | 115 | 10 | 0 |
| *Plasterers:* Lockwood Bros., Wakefield* | 50 | 14 | 0 |
| *Painters:* W. Carver, Wakefield* | 31 | 18 | 0 |

[Eighty-five Tenders received.]

RAMSBOTTOM (Lancs.).—For 1,300 yds. of earthenware pipe sewers, etc., for the Urban District Council. Messrs. J. Diggle & Son, engineers, Heywood and Westminster:—

J. Arundel Exors., Bradford* ..... £806 8 9

RAMSBOTTOM (Lancs.).—For constructing Annie-street, for the Urban District Council. Mr. T. H. Bell, Surveyor, Council Offices, Ramsbottom:—

C. Lomax, Orchard Mill, Ramsbottom* .. £121 6 10

ST. ALBANS.—For erecting swimming baths in Cotton Mill-lane, for the Corporation. Mr. G. Ford, City Surveyor. Quantities by Messrs. Franklin & Andrews, Ludgate-hill, E.C.:—

| | | | |
|---|---|---|---|
| J. Dickson | £1,611 | J. T. Bushell* | £1,275 |
| E. Dunham | 1,400 | | |

[All of St. Albans.]

ST. MERRYN (Cornwall).—For building a new Wesleyan Chapel, for the St. Merryn Wesleyan Chapel Trustees. Messrs. J. Ennor & Son, architects, Central-square, Newquay:—

| | | | |
|---|---|---|---|
| R. Warne | £598 | 10 | W. S. Tippett, Newquay* £545 0 |

SLEIGHTS (Yorks).—For the erection of a seven-roomed bungalow, for Mr. E. Anderson. Messrs. Barrett & Driver, architects, 23, York-place, Baker-street, W.:—

| | | | |
|---|---|---|---|
| J. Braim & Sons | £326 | 10 | 0 |
| W. Chapman | 316 | 0 | 0 |
| T. R. Fletcher | 302 | 0 | 0 |
| R. Harland | £296 | 0 | 0 |
| J. Hutchinson, Sleights‡ | 241 | 8 | 6 |

‡ Accepted reduced Tender, £220.

STANLEY.—For making of Back Towneley-street, for the Urban District Council. Mr. J. Routledge, Surveyor, Council Offices, Stanley:—

| | | | |
|---|---|---|---|
| J. Thompson | £266 | 16 | 0 |
| R. C. Birtley | 127 | 3 | 9 |
| J. McLaren & Son | 123 | 16 | 6 |
| Johnson & Strong, Stanley* | £119 | 5 | 6 |

TODDINGTON (Glos.).—For the erection of a pair of six-roomed cottages and a seven-roomed single cottage and bath-room, for Mr. H. Andrews. Messrs. Barrett & Driver, architects, 23, York-place, Baker-street, W.:—

*Pair of Cottages.*

| | | | |
|---|---|---|---|
| G. Howman & Co. | £463 | Collins & Godfrey | £356 |
| T. Hopkins | 423 | Estcourt & Sons* | 306 |
| J. A. Oakey | 420 | | |

*Single Cottage.*

| | | | |
|---|---|---|---|
| J. A. Oakey | £426 | Collins & Godfrey | £324 |
| T. Hopkins | 395 | Esplay & Co., Ltd. | 295 |
| G. Howman & Co. | 346 | A. Estcourt & Sons* | 274 |

TRIMDON.—For alterations and additions to parochial schools. Messrs. J. Potts & Son, architects and surveyors, 57, John-street, Sunderland:—

| | | | |
|---|---|---|---|
| J. M. Boyd | £137 | 10 | J. Armitage, Sunderland* £116 0 |
| W. V. Stelling | 120 | 0 | |

WHITBY.—For erecting a pair of semi-detached villa residences, Bagdale, for Mr. Harrison Baxter. Mr. E. H. Smales, architect, 5, Flowergate, Whitby:—

| | | | |
|---|---|---|---|
| *Excavating, Brickwork, and Masonry:* J. Gladstone, Whitby* | £1,100 | 0 | 0 |
| *Carpenter and Joiner:* J. White, Whitby* | 518 | 16 | 0 |
| *Slater:* Dodgson, York* | 83 | 15 | 0 |
| *Plastering:* Smithson & Taylor, Whitby* | 125 | 0 | 0 |
| *Plumbing, Glazing, etc.:* J. Brown & Son, Whitby* | 198 | 10 | 0 |
| *Painting:* W. Henderson, Whitby* | 26 | 5 | 0 |

*Full Tenders Received.*

| | | | |
|---|---|---|---|
| J. Kidd | £2,572 | 14 | 0 |
| Coverdale & Longhorn | 2,533 | 10 | 4 |
| W. Chapman | 2,398 | 18 | 0 |
| A. Palfroman | 2,278 | 15 | 6 |
| J. Brain & Sons | £2,262 | 10 | 0 |
| T. R. Fletcher | 2,124 | 0 | 0 |
| R. Lennard & Son | 2,115 | 0 | 0 |

[All of Whitby.]


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*See Advt. p.* xxvii.

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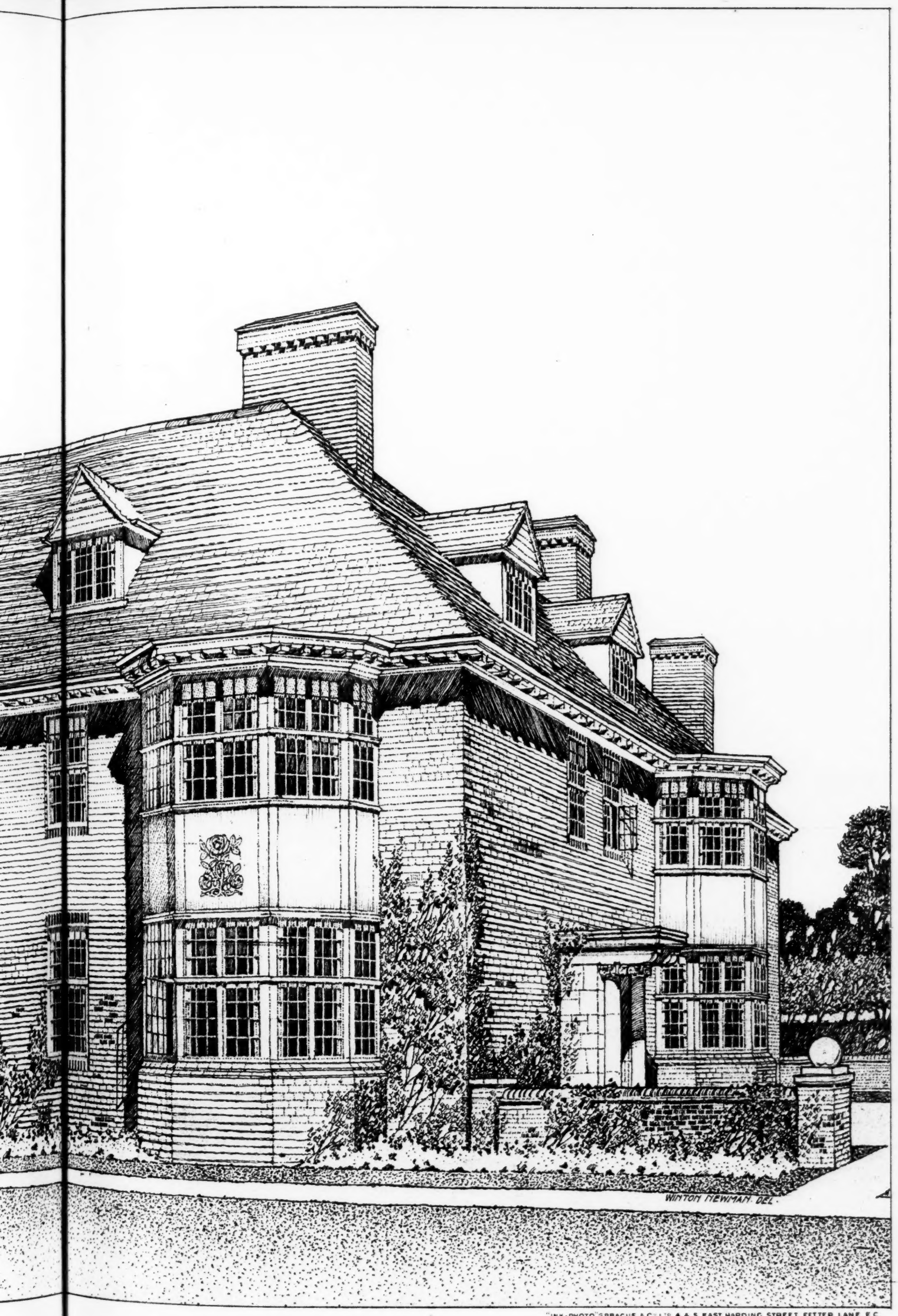


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AT REIGATE—MR. ERNEST NEWTON, ARCHITECT

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HOUSE AT BICKLEY, KENT.—Mr. Ernest Newton, Architect.

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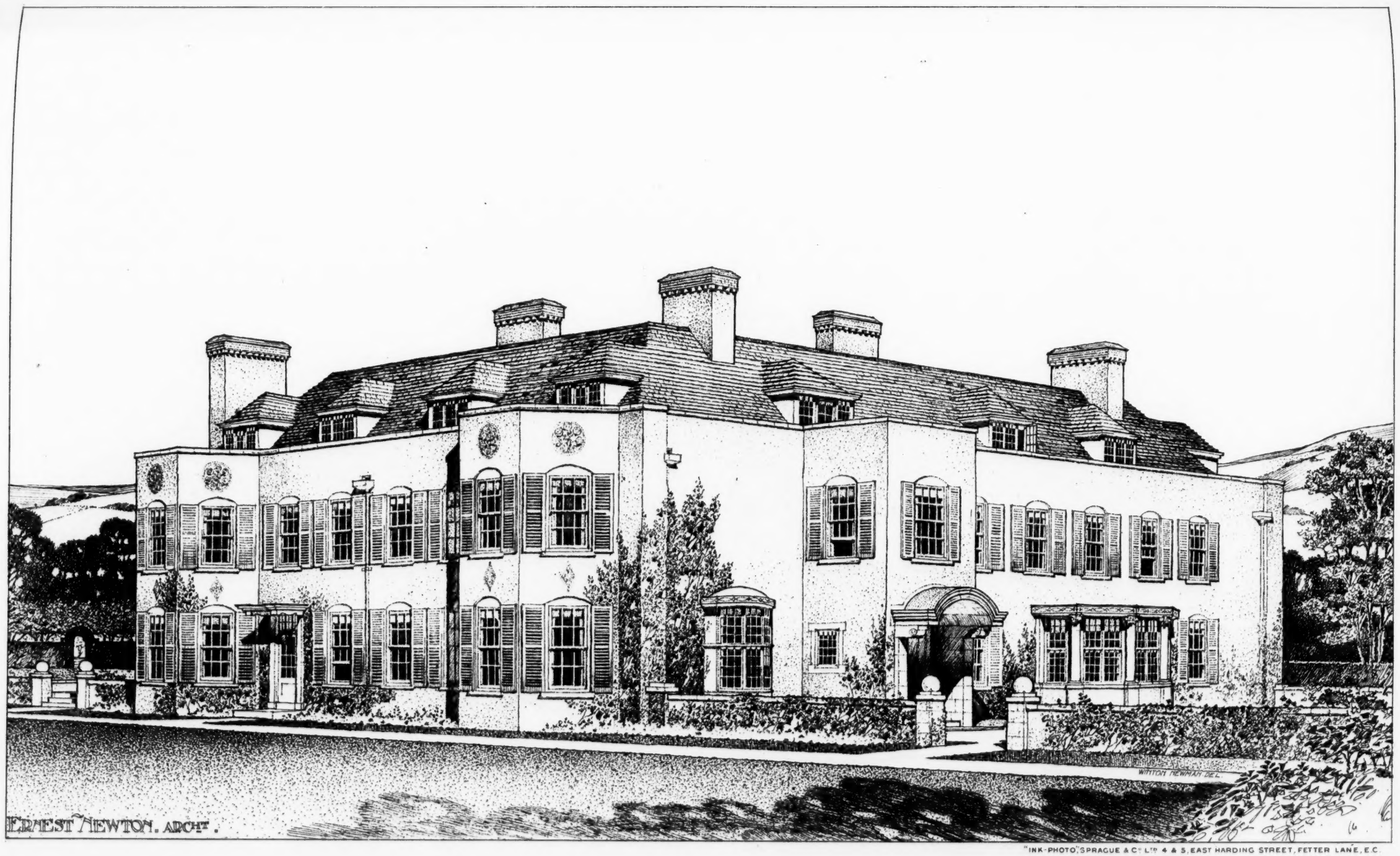
HOUSE AT BICKLEY, KENT.—Mr. Ernest Newton, Architect.



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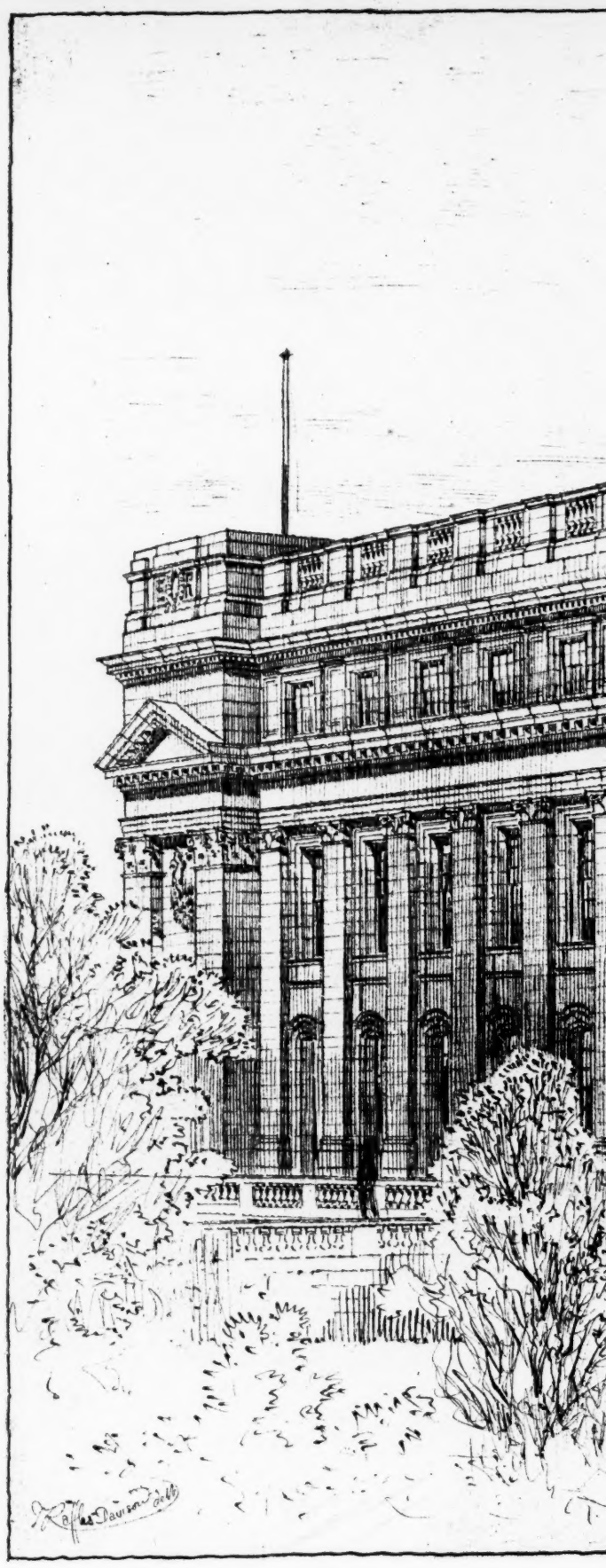

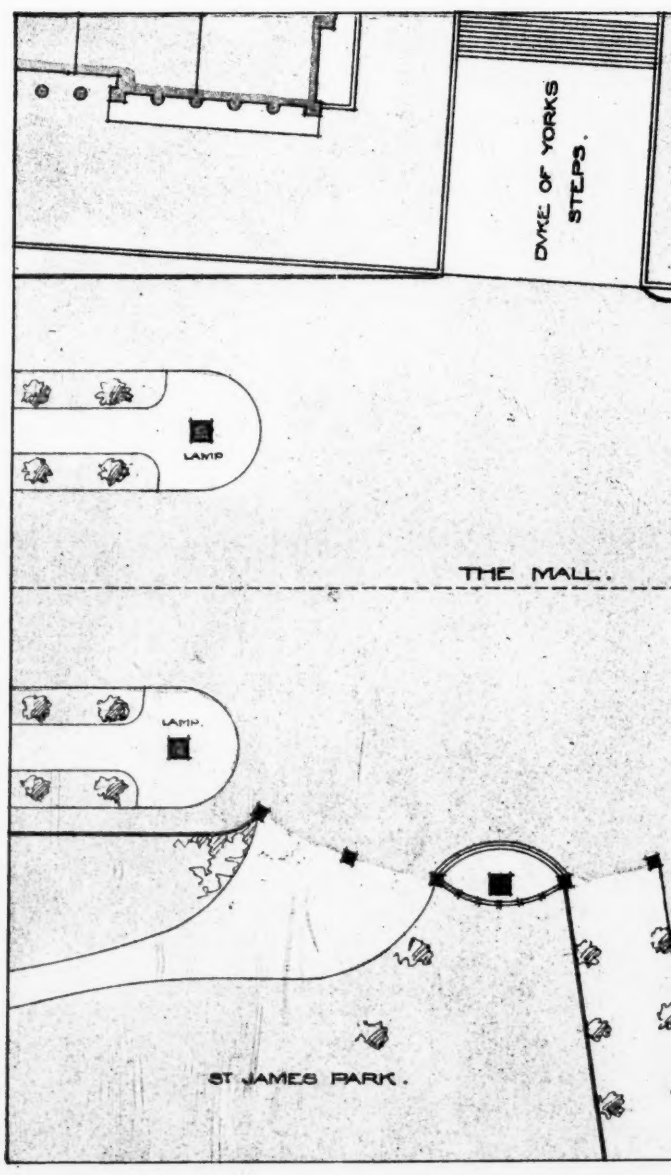
DUKE OF YORKS
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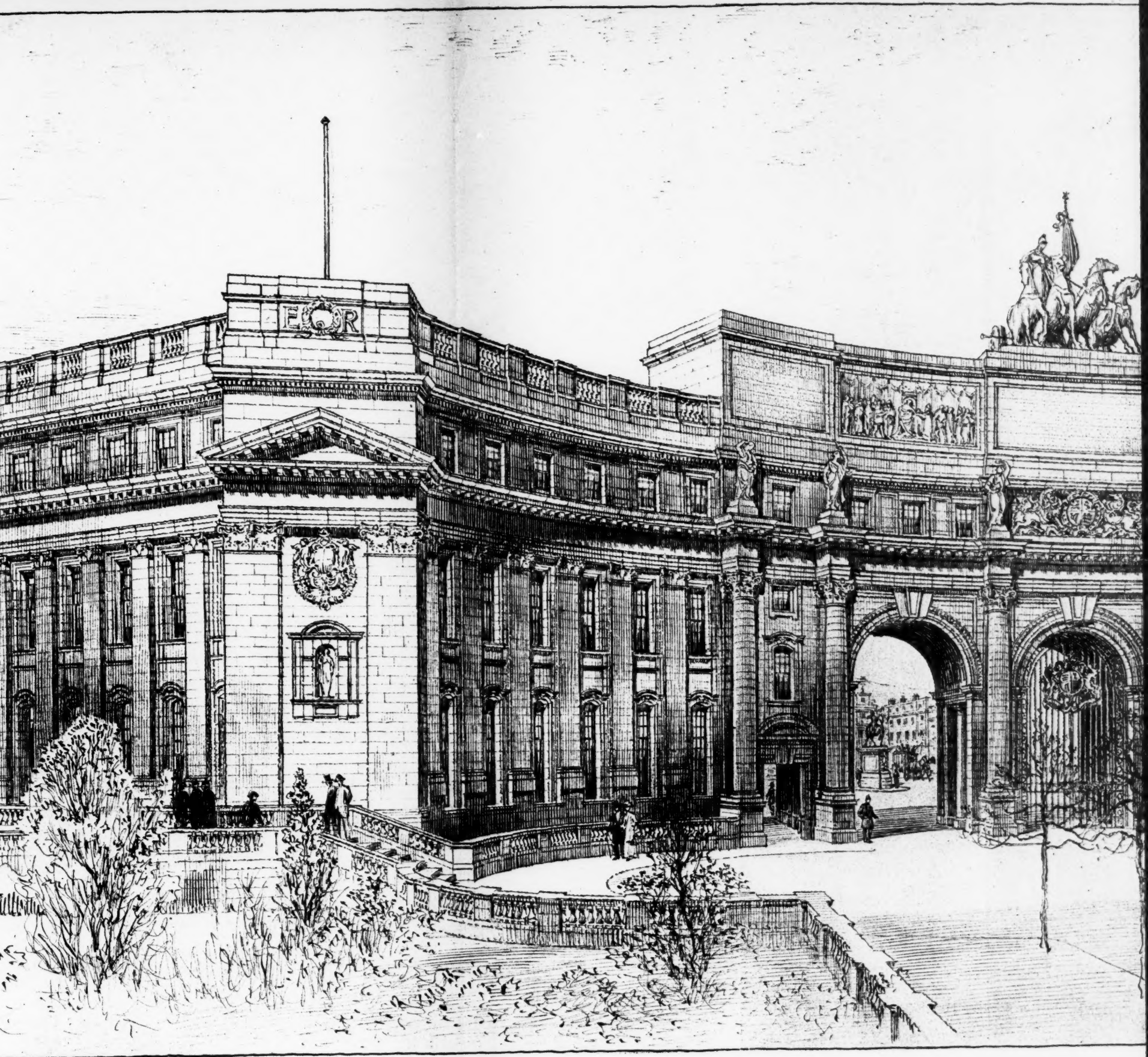
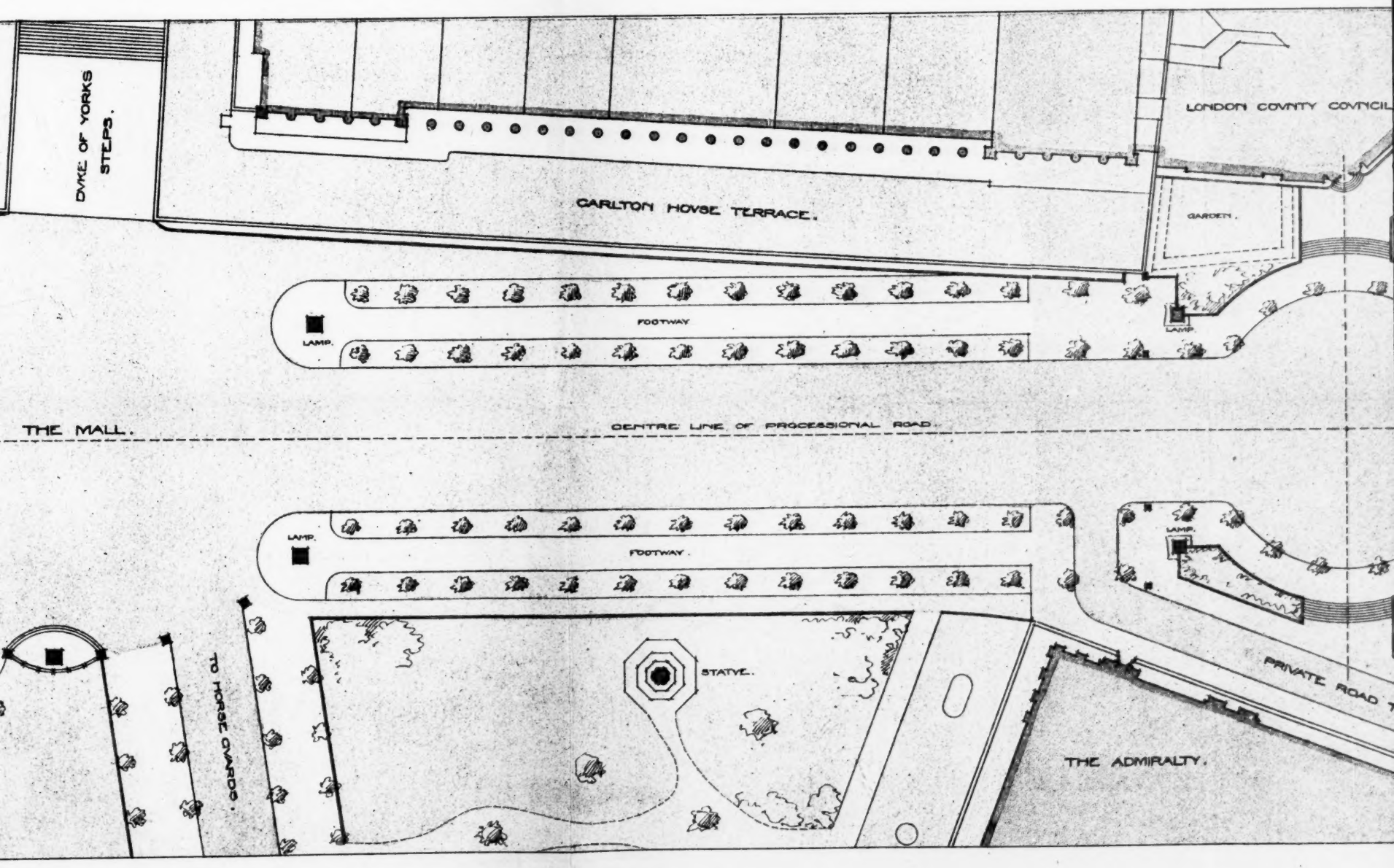
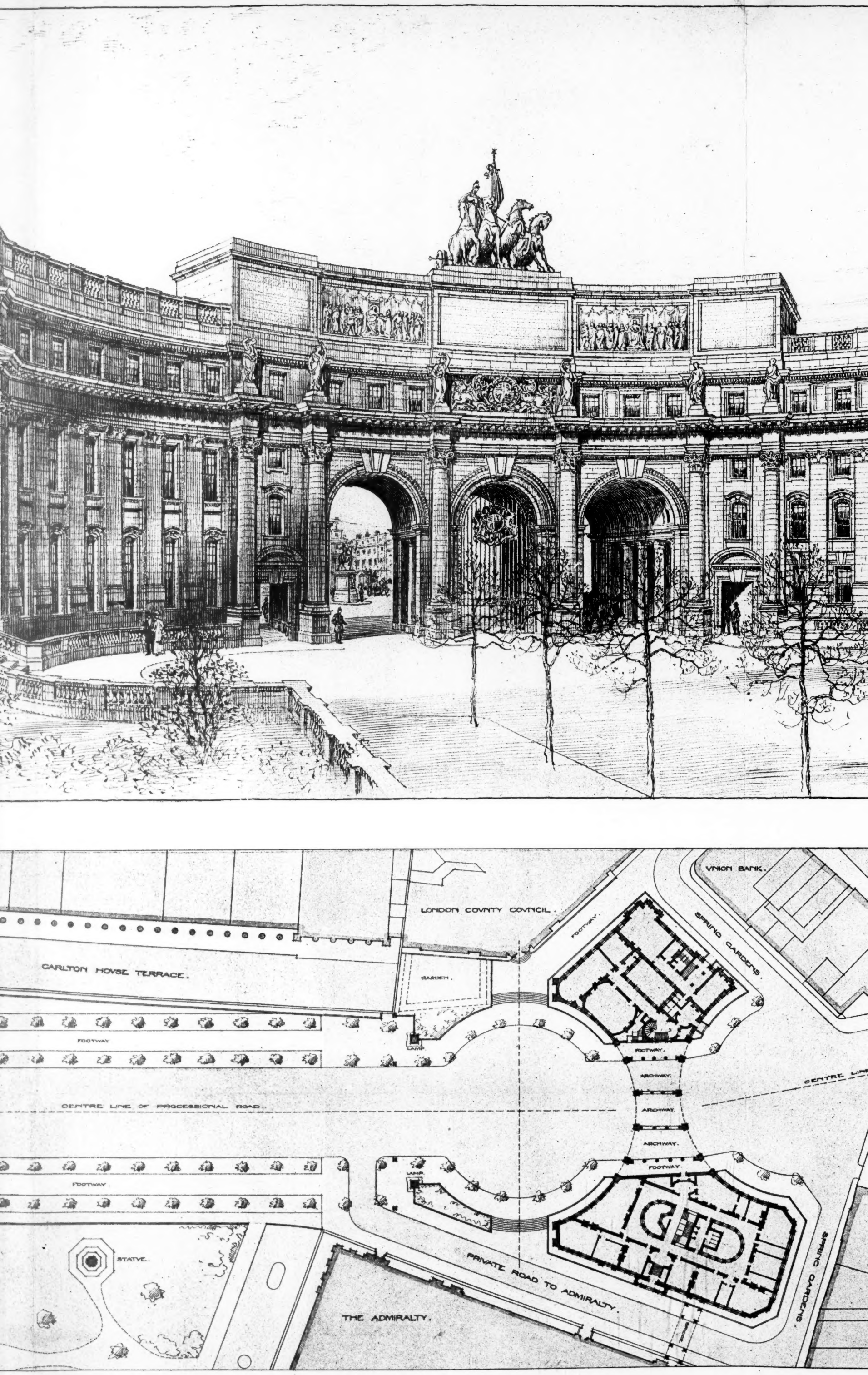
THE MALL.
LAMP.
ST JAMES PARK.

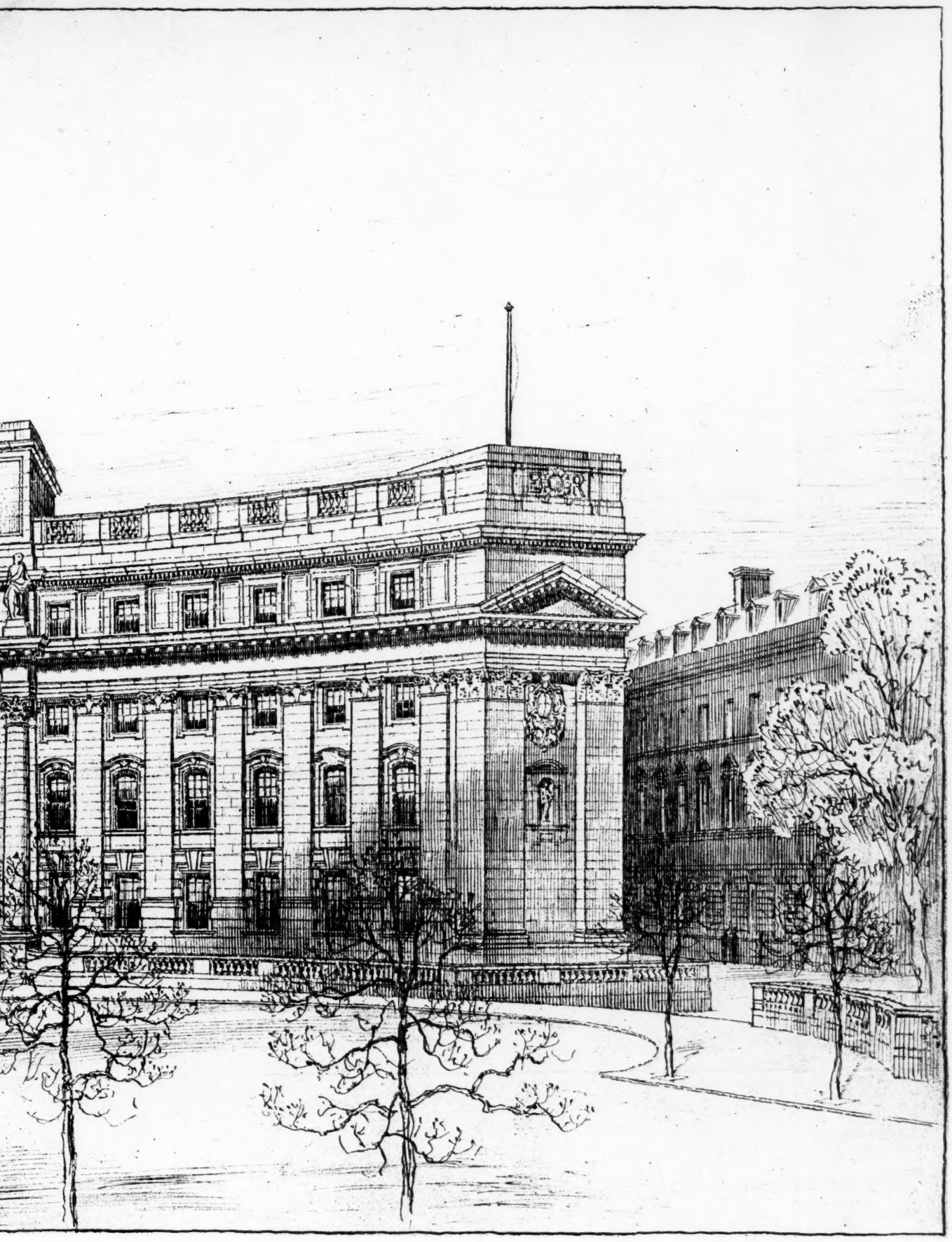


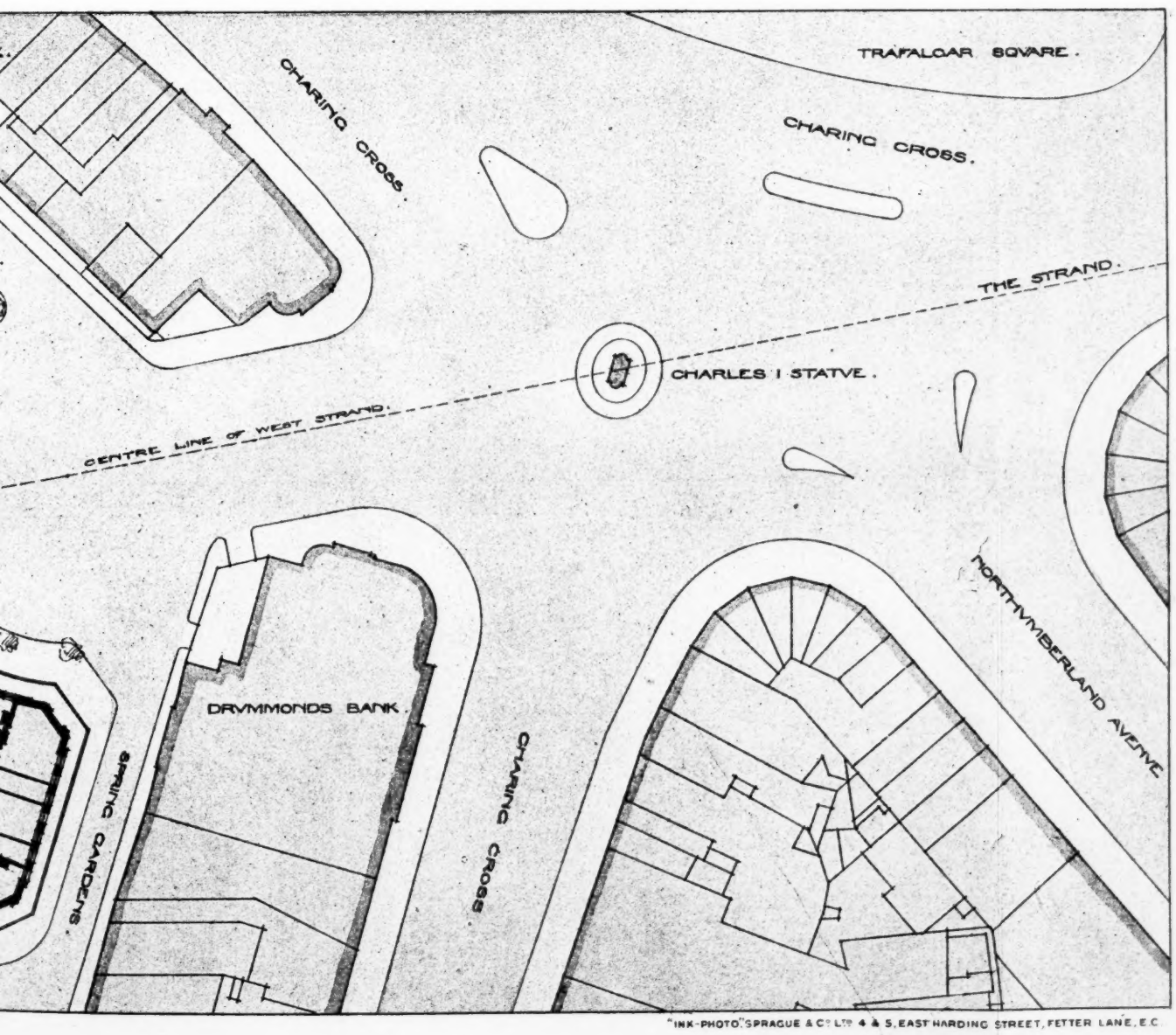



PROPOSED NEW BUILDING AT EAST END OF MALL, AND ROADWAY THROUGH




ED NEW BUILDING AT EAST END OF MALL, AND ROADWAY THROUGH TO CHARING CROSS.—Sir Aston Webb, R.A., Ar



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